DESIGN AS A FUNCTIONAL LEADER: A CASE STUDY TO INVESTIGATE THE ROLE OF DESIGN AS A POTENTIAL LEADING DISCIPLINE IN MULTINATIONAL ORGANISATIONS

MERSHA AFTAB, MA

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MERSHA AFTAB

A thesis submitted in partial fulfilment of the requirements of the University of Northumbria at Newcastle for the degree of Doctor of Philosophy

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ABSTRACT

This research investigates the role of design as a 'functional leader'[1] in multinational organisations, to drive innovation successfully at a strategic level. It involved a detailed case study of the innovation process, and practices within Philips Design, Eindhoven, The Netherlands, where design is a key function within the company but not yet recognised as a leading strategic discipline. Philips Design wanted design research to build an integrated map of its actual practices and correlate these with other corporate innovation practices, to help establish strategic recognition for their value. The doctoral challenge was to explicate the process and determine whether the findings have generic capacity to support the role of design as a leading functional discipline.

The investigation integrates an iterative loop of; abductive reasoning of design thinking and inductive reasoning of management thinking in an action research cycle. The case study was an empirical enquiry, where the researcher became a 'participatory observer' at Philips Design, conducting one-on-one interviews for data collection and refining their analysis using a Delphi Technique. The contribution to knowledge has been generated by combining these research methods to represent data in a logical manner using visual mapping techniques to produce an explicitly defined 'design innovation process map' for Philips Design. Comparison with three other multinational organisations explored how each perceives the contribution of design and the different roles it plays in their organisation. Triangulation with a third party expert was also used to validate the findings.

[1] Functional Leader – The concept of functional leadership was first practiced at the Royal Military Academy to train officers in the responsibilities of leadership. The theory was first developed in the 1990's and stated that functional leadership overlaps the needs of the group and the individual working in the group; also known as the action centered leadership. Since its inception, the theory has been evolving to suit its capability in other industries. See: Adair, J. (1990) *Leadership and motivation: The fifty-fifty rule and the eight key principles of motivating others,* London, Talbot Adair Press.

The correlation of the research with literature in the field explored the relationship between human behaviour, organisational culture and business innovation cycles and took this an incremental step forward by visually illustrating the conceptual relationship between different theories. The focus became understanding the reasons for the differences between the thinkers and the practitioners in a design team. Significantly, this led to it validating the theory of 'Design Driven Innovation' by Roberto Verganti (2009). The study contributes value to his theory of innovation by highlighting four gaps in its application in multinational organisations and demonstrates that design can share the role of innovation leadership with other important functions only if it has an explicit process that aligns with organisational brand values and communicates the value generated by design effectively to the wider team.

Therefore, whilst the research has not been able to confirm whether design can lead an effective innovation process at a strategic level, rather it needs to share this role in multinational organisations, it has identified the major reason for this as the differences between design team thinkers trying to find viable options for the future and practitioners trying to defend the core business in their organisation, resulting in a gap between strategy and operation. The research has confirmed the conditions for design to act as a leading functional discipline and provided design practitioners with tools that can help in strategic decision-making.

It is hoped this research will inspire design researchers to carry out further study on the topic to improve and develop knowledge and competency to support the strategic role of design as a leading functional discipline in organisations. Also, that business, strategy and marketing researchers will be inspired to generate theories that could link the strategic role of the design innovation process to strategies in their own fields. Finally, the research identifies the need for quantitative research to explain the qualitative conceptual relationships it has

depicted between designer behaviour and organisational culture in the different innovation cycles that exist in multinational organisations.

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AUTHORS DECLARATION

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others. The work was done in collaboration with Philips B. V., Eindhoven, The Netherlands.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the School Ethics Committee on 15th September 2011.

Mersha Aftab

Signed:

July 2013

PREFACE

The research was sparked by an opportunity to work with Philips Design based in The Netherlands, a leading design driven organisation in Europe. Having gone through 4 years of under graduate study in fashion and information technology and 1.5 years in design management education, I found myself surrounded by unsolved questions about design and its role in organisations. I gained insights into the role of design in automotive manufacturers, design processes, ergonomic considerations, design research, and provocation by design during my master's studies. Experience was gained in strategy and marketing aspects of design during two years of work experience in the retail organisation in India. However, the changes within the organisation and stagnation of the use of design skills as a mere aesthetic, styling and beatification source resulted in a career shift. The masters thesis involved me gaining knowledge on how design could help in mobilizing inside-out and outside-in innovation strategies and encourage collaboration for a sustainable business innovation strategy in the automotive industry, which in 2009 was struck by the economic crisis.

I was particularly interested in designs' ability to solve real world problems and its high visual and tactile nature of the interaction. I had experienced design as a creative tool that gives shape and style to products and as an explorer of opportunities to identify the problem area. My observation showed a third important aspect of design that had not been explored yet, that aspect being the role design plays in multinational organisations. Out of this observation grew a conviction that such an aspect of design, where design could drive the innovation processes in multinational organisations at a strategic level could present a fertile ground for a PhD study. I wanted to satisfy my deep curiosity, stemming from the exposures of design practice, by exploring this problem and studying a design team involved in driving innovation in an organisation. I was particularly drawn to the topic of the process used by design teams to lead innovation in an organisation at a

strategic level. Hence, I involved myself in mapping the strategic process at Philips Design.

Not knowing what I would find and whether it would yield any meaningful results I embarked on a PhD journey driven by personal curiosity and an inspiration to work with Philips Design. At that point I called it "effective mapping of complex innovation systems in a multinational organisation from a design case study perspective". Having established that design with its methodologies, ideologies, philosophies and tools is gaining recognition in organisational research. Also, design has immense impact on organisations and their innovation policies, in the course of the study I decided to pursue two main research aims:

- To establish design as a functional leader in a multinational organisation.
- To enable design to drive a successful innovation process at a strategic level with the above stated role in a multinational organisation.

The results of this endeavour are presented in this study and are my contribution to the academic debate. I sincerely hope that you will have as much pleasure reading this thesis as I had researching it.

ACKNOWLEDGEMENT

I especially would like to thank Professor Robert Young, for being my principal supervisor and a source of inspiration throughout my study. He did not only keep a watchful eye on the academic conduct of my PhD, but also was extremely instrumental in guiding me towards the completion of a successful study. Special thanks to Elizabeth MacLarty, for being my second supervisor. She guided me towards a good academic conduct and was a source of motivation throughout. Their continuous trust, guidance and extraordinary patience enabled me to focus on my research and significantly improve my scholarly skills.

Many thanks go to Professor Steven Kyffin, for his valuable time and sharing his cutting edge knowledge and giving me the opportunity to be a part of Philips Design. His repeated inspiration and extraordinary support enabled me to purposefully engage with the study. Thanks to Professor Kevin Hilton, for his guidance to secure an ethical study along with Mr. Bruce Watson for being a third eye of scrutiny at various peer reviews and progression sessions.

In addition, I wish to thank Mr. Paul Gardien, Vice President at Philips Design for giving me an opportunity to be a part of an esteemed organisation and use the resources for my study. Special thanks to Dr. Reon Brand, Senior Director, Foresight, Trends and People Research at Philips Design for being my supervisor at Philips Design. His guidance and support helped me achieve great clarity and understanding of practice of design at Philips. Their critique has been a great source of inspiration throughout the study.

I wish to show my appreciation to the design research team at Philips Design for actively participating in my research and providing me with information I needed. They were a source of happiness and motivation through the 9 months of my internship and beyond.

Furthermore, I wish to thank the organisers of Design Means Business, Newcastle, Open Innovation and New Business Creation, Billund and The Continuous Innovation Network, Arhus for taking interest in my research and allowing me to participate in their conference as a volunteer as well as a presenter. These conferences were a source of knowledge and opportunity. I give special thanks to organisations for agreeing to participate in my research exploration and providing me with helpful insights.

Many thanks, to Pablo Puente Guillen, my husband, who gave me the strength and motivation to work even harder. I dedicate this work to him for his love, care and drive towards my aspirations and me.

My parents and my sister deserve special thanks who, in their love and wisdom equipped me with the necessary mind-set, determination and resources to successfully reach a point, at which I was ready to undertake this demanding project. Last but not the least, thanks to my families in India and Mexico who were a great source of motivation.

INTRODUCTION

CHAPTER ONE: INTRODUCTION

1.1 Background and Research Focus

This thesis is based on a programme of research that investigates the tools that could establish design as a functional leader in multinational organisations[2] and help design drive innovation at the strategic level[3] successfully. The research subject evolved from my interest in the topic of innovation pushed by design and my knowledge in the field.

The impetus for carrying out this research was an opportunity to work on a project with the pioneering design innovation company Philips Design[4], based in Eindhoven, The Netherlands. As design is one of the key decision making functions[5] within the organisation, Philips Design wanted to use design research to build an integrated map of their actual practices. I therefore undertook a nine-month internship that gave me an opportunity to explore the exclusive structure of Philips Design, while being a part of their Research Development and Innovation (RD&I) strategic team. The project required me to define, refine, and map the design process that was core to the development of innovative thinking, which

[2] Multinational – Dictionary defines multinational as an adjective and a noun stating a company operating in several countries. In this study, I use multinational to define organisations having several research and development centers around the world despite its headquarters being in the city of its origin. See: Encyclopedia-Britannica-Company *In:* Encyclopedia-Britannica-Company (ed.) *Marriam-Webster.* Encyclopedia-Britannica-Company.

[3] Strategic Level – Strategic level is a term used to describe the top-level management in an organisation and their long term planning. The strategic level management involves in making policies and decisions. These decisions aim at setting direction for the whole organisation in order to deliver on their mission statement and enable the business to be profitable. See: Mintzberg, H. (1987) Crafting strategy. *Harvard Business Review***,** 66-75.

[4] Philips Design - Philips Design specifically indicates the team called Research Development and Innovation (RD&I) and the design function within Philips corporate.

[5] Function – The term 'design function' represents design being recognised as a core discipline in any organisation. Any organisation recognising design as a function gives it equal importance in comparison to other functions such as research and development, technology, or strategy. Design as a function is able to add more value in decision making of an organisation than when it is in a support role. See: Ling, B. (2008) What role does design play whithin your organisation? *In:* Bobby (ed.) *Design leadership.* design sojourn.

resonated throughout Philips[6]. The internship provided me with the opportunity to understand that building a strong design strategy is an important part of the evolution process used by design to become a core participant in the development of itself as a leading functional discipline. This research illustrates the potential opportunities and effective methods that design could use to determine it as a leading functional discipline by developing fundamental capabilities within an organisation.

The research takes the practice of design in organisations and aims to convert these practices into theoretical knowledge to enrich the understanding of organisational research for design. An initial area of focus for the study involved constructing a research programme that would investigate and identify practical means that enabled organisations to improve innovation practices initiated by design. Then improve those practices to enable a well-aligned and networked design innovation strategy across all platforms in the organisation. The first step to identify these practices was demonstrated by the mapping of the innovation process followed at Philips Design (Section 1.3). Additionally, the Philips Design RD&I team was involved in conducting state of the art research activities, which included writing research papers for internal distribution as well as external publication. Simultaneously, the team was also involved in implementing new theories of innovation into their practice. Many successful theories were adopted and integrated over the last ten years of Philips Design's existence, making it pertinent for me to identify the closest relatable theory to the mapped innovation process. After mapping the innovation process, an analysis was made (detailed in chapter 7), which confirmed that the RD&I team was related most closely to the theory of Design Driven Innovation (Verganti, 2009). My research subsequently set about to identify the gaps in this theory, as related to practice at Philips Design. Additionally, it also contributed to knowledge by providing suggestions that could

[6] Philips is used define the organisation Philips B.V. in Netherlands as a whole entity.

fill the gap and make the theory applicable to multinational organisations such as Philips Design.

The investigation needed to gain further understanding of the design strategies that were both currently available and implemented. This understanding was achieved by exploring other organisations, and this exploration in turn furthered the understanding of other available strategies. This was considered appropriate because the methods already in use at Philips Design were not effective enough to drive design to the level of a leader in the organisation, in comparison to functions such as technology, strategy, and marketing.

Today design is an established discipline[7] in academia with capabilities from a combination of skills, knowledge, understanding and imagination. These combinations are further consolidated by experience, which form the foundation for design education. In 1979, a report by Archer (2004, p. 5) and his colleagues at the Royal College of Art referred to design with a capital 'D', and represented it as one of three prominent cultures: science, humanities and design (the latter of which also included technology). They differentiated between these three diverse cultures in terms of phenomenon of study, appropriate methods and values prevalent in each of them. It was shown that sciences and humanities are easily contrasted whereas design shared the characteristics of having a material culture, of a maker and doer with technology. Conversely, Kazmierczak (2003) argues that design research is inseparable from the user. Supporting Kazmierczak's (ibid) theory, Almquist & Lupton (2010, p. 4) state that the main contribution from the humanities to design has been in understanding of meaning of objects in particular moments in time in particular groups and interests. Additionally, Thompson (2011)

[7] Discipline – Mostly related to academic field of study. It signifies a branch of knowledge promoted and taught widely at the universities, accepted by journals in which its research is published, the departments, learning societies, departments and faculties where its practitioners live including organisations. See: Anon. (2012) Discipline. *In:* Farlex, T. F. D. B. (ed.) *The Free Dictionary.* Farlex. Inc.

claims that design is seen as a sub-discipline[8] in many technological schools, like design in a school of civil engineering. Brown (2011) talks about engineering design as a scientific discipline as its processes and methodologies are fit to be recognised as a scientific enquiry.

Today, design is seen developing new theoretical knowledge to enrich its discipline with a scientific mode of enquiry that also enriches its practice[9]. The development of theoretical design knowledge has influenced design's recognition in its practice in organisations.

New theoretical knowledge has introduced the idea of design value contribution in organisations. This includes value generation by design for organisational strategy (Mozota, 2003), idea generation and a research tool (Schön, 1983, p. 7), product differentiation by design (Lorenz, 1988), a support function in the product development process (Poggenpohl and Satō, 2009, p. 97), a tool to understand and develop user-centred design innovations for commercialising ground breaking products (Esslinger, 2009a), design thinking (Brown, 2009), and finally the driver of value generated innovation through Design Driven Innovation (Verganti, 2009). Verganti (ibid p. 7) claims that,

> *"This new concept of design requires resources, something much more than style magazines and trends, and it moves beneath the superficial to the core of Design Driven Development".*

[8] Sub-discipline – The use of sub-discipline was made to point out the lack of design being a recognized partner discipline for engineering departments in academia. I have used the argument to state that the knowledge base of the design discipline is developing in a way that has established it as a sub-division of engineering schools. The future might see it as a partner discipline. For a counter argument see: Thompson, M. K. Establishing design as a discipline in civil and environmental engineering. *In:* Thompson, M. K., ed., 2011 Kaist, Korea. Korea Advance Institute of Science and Technology, 1-4.

[9] Practice – I have used the word practice to explain the role design takes in organisations. Design practice in organisations is related to design being a supporting function, a consultant, a recognised function, or a functional leader. The original idea of design practice talks about the professional practices of designers involved in their daily routine while they find their way out of messy and indeterminate situations. For the original text on design as professional practice see: Schön, D. A. (1983) *The reflective practitioner: How professionals think in action*, Basic Books, Inc.

The aforementioned organisational practices have paved the way for design to be recognised as a key function that could drive innovative strategies. While taking the role of a function, design has had the opportunity to contribute to decision-making in few organisations that allow design to explore this role, although design's contribution is not considered most essential to the process. As claimed by Verganti(2009), Brown (2009) and Jonas (2001), today design is not merely providing support but is a stakeholder in an organisation's success and failures.

However, despite holding more responsibility as a function, design does not yet contribute to adding value in making new strategies, and is still not a recognised core function for many organisations. This means that design is largely not involved in making decisions at the strategic level that could influence the foundation of the organisation's structure and the way they conduct their business. To be able to do this, design has to be recognised as a functional leader by the organisation (as supported by (Brown, 2009; Verganti, 2009). According to Adair (2003), leading functional disciplines are teams within the structure of organisations that enable the role of a particular discipline to be performed to its highest capability. Rather than giving leadership and decision-making power to an individual, functional leadership disciplines exercise leadership as a group[10]. For design to act in this way it needs to be allowed to contribute to decisions that influence the strategy of an organisation. This practice in organisations requires disciplines to build their own competency and contribute in building strategy for the future.

[10] Group – The concept of providing leadership from a group is core to leading functional discipline. In this concept, leadership is not about 'who' but 'how', where each functional discipline is involved in enabling leadership and decision making. See: Musa, M. (2010) Analysing leadership theory in a social psycological perspective. *In:* Astuti, D. S. R. (ed.). Bandung: Padjadjaran University.& Dreikorn, M. J. (1961) Integration. *In:* Dreikorn, M. J. (ed.) *The synergy of one: Creating high-performing sustainable organizations through integrated performance leadership.* Milwaukee: ASQ.

Philips Design is an example of an organisation that recognises design's value as a function and wants to establish it as one of its leading functional disciplines. In order to achieve this, they established the research development and innovation team (RD&I) to work at the core level[11] and participate in the functional leadership programme[12]. The functional leadership programme aligned the functional leading disciplines into providing a path towards building Philips into a knowledge-based[13] organisation. Philips Design represented itself at the strategic level through its chief design officer, and the RD&I group was recognised as a core process to carry out value proposition and value development for Philips. The processes run by RD&I aligned strategic level decisions to the rest of the stakeholders.

Despite being provided with a platform to lead as a function at Philips Design, the RD&I design innovation process was surrounded with problems of ambiguity, discontinuity, lack of alignment and ownership. The need for Philips Design to propose and develop value and lead Philips innovation objectives appeared overambitious due to the problems within the design function. Philips Design therefore decided to use design research to identify the issues within the function of design and define, refine and map the practices they have been carrying out over the past 10 years. It was this issue that I became involved in solving for Philips

[11] Core Level – It is the second level management group that reports directly to the chief executives at Philips Design. The core level is a part of the organisational structure of Philips Design and is a part of the internal structure of the organisation. RD&I group is a part of the core level management and they work in line with the strategic level decision making. See: Chapter 4 section 4.2 named, Philips Design – Case Study Process.

[12] Functional Leadership Programme – A programme developed in order to align all functions within Philips. This programme establishes design as one of the leading functional disciplines. It requires design to align its activities and processes explicitly within the Philips innovation framework. Within this programme all strategic level processes, core level processes and support processes are audited. In: Gardien, P. (2008a) company innovation programme 2009. Eindhoven: Philips B.V.

[13] Knowledge based organisation – Knowledge based economy is seen to be the new phenomenon in this globalised civilization. Organisations consider knowledge as the biggest asset and design plays a crucial role in collecting tacit knowledge and giving it an explicit form. In knowledge based organisations 'knowledge' is seen as their soul. See: Brinkley, I. (2010) Knowledge economy strategy 2020: The work foundation submission to the comprehensive spending review. London: The Work Foundation. & Conklin, J. (2001) Designing organizational memory: Preserving intellectual assets in a knowledge economy. Available: http://cognexus.org/dom.pdf.

Design. I anticipated that while mapping the RD&I innovation process I would get valuable insights into the best innovation practices and challenges to run a successful innovation process for business and enable design to be formally established as one of the functional leads. Therefore this research observes the way design research shapes the innovation process in a multinational organisation.

This research proposes design to be one of the leading functional disciplines of the organisation and perform under certain special conditions. It also proposes employees should know the challenges in pursuing Design Driven Innovation (Verganti, 2009). Design is seen providing solutions in order to overcome these challenges through an explicit design process, relating directly to brand essence[14], communicating value created by design and receiving support by the corporate culture.

This study later evolved into an investigation of design-instigated innovation and strategy used within organisations like Philips Design.

1.2 Philips Design Innovation Process

During the nine months of internship I was an observer at Philips Design and also actively participated in the beginning of the innovation cycle for the year 2009. Under the umbrella of an action research cycle I incorporated the Delphi technique and informal interviews to complete the goal of the project. I was involved in the refining, defining and mapping of the innovation process being carried out by the Philips Design RD&I group. This innovation process aligned the strategic decisions taken by the Philips Innovation Board (PIB) comprising the head of all

[14] Brand essence – The essence of the brand signifies the value that the brand is trying to sell. For a few, brand essence is tied to product experience that the brand provides and for others it might be the products benefits. See: Kapferer, J.-N. (2004) *The new strategic brand management: Creating and sustaining brand equity long term,* London, Kogan Page Publishers.

leading functional disciplines namely technology, strategy, marketing and design (Figure 1.1).

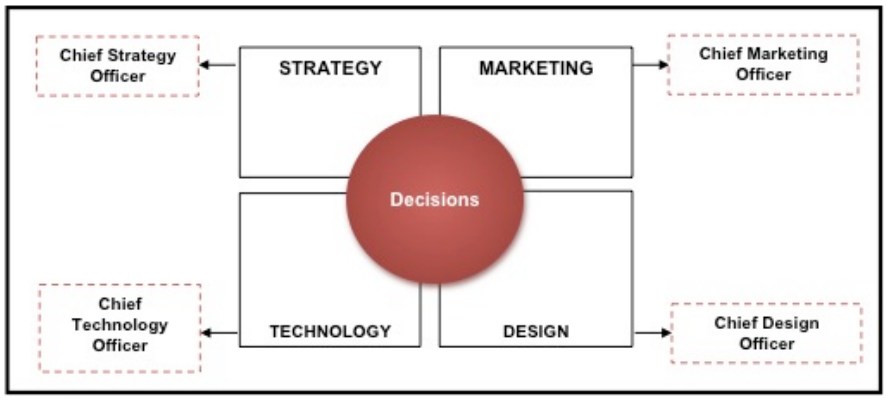

Figure 1.1: Corporate functions (PIB)

The PIB operated at the strategic level where the chief design officer formulated design strategy in accordance to other members of the team (Figure 1.2). The PIB then connected to the rest of the organisation through its core processes, which was run by the RD&I innovation process of value proposition and development. Philips recognised the importance of design to be well integrated within business. The RD&I innovation was based on the platform of collaboration and it discovered, explored and selected future innovation themes for the Philips innovation programme.

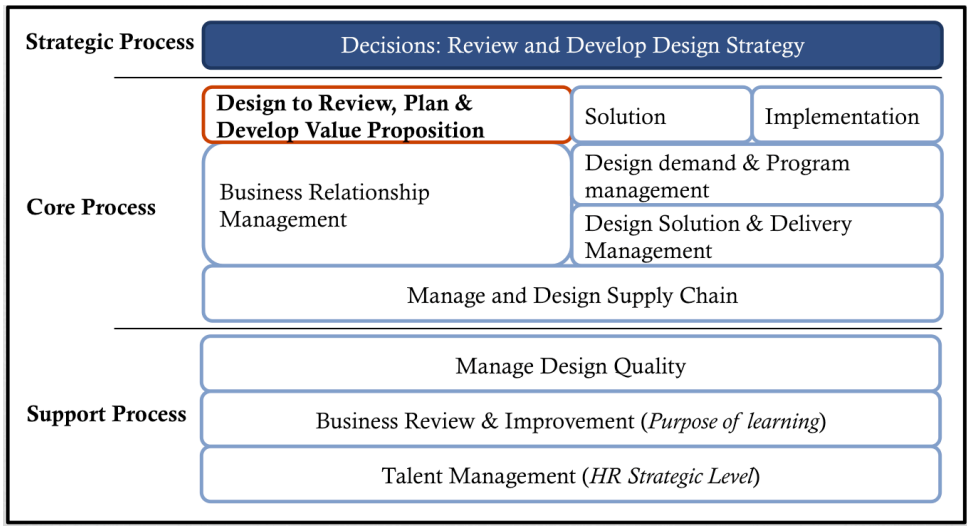

Figure 1.2: Design leadership & intelligence used as a core process in the strategic level (Gardien, 2008b).

The Philips Design innovation process divided into three broad actions.

The first, *future perspectives* undertook people and trend research defining possible growth areas through insight for further exploration and explored future areas through design probes (Figure 1.3).

The second, *theme research*, interrogated growth areas by carrying out experiments and developing knowledge and competencies; it also obtained stakeholder insights on desirability of the concepts through application experiments (Figure 1.4).

The third, *design value contribution*, supported platforms for new business, by developing stakeholder solutions that contribute defendable IP and pre-seeded concepts plans (Figure 1.5).

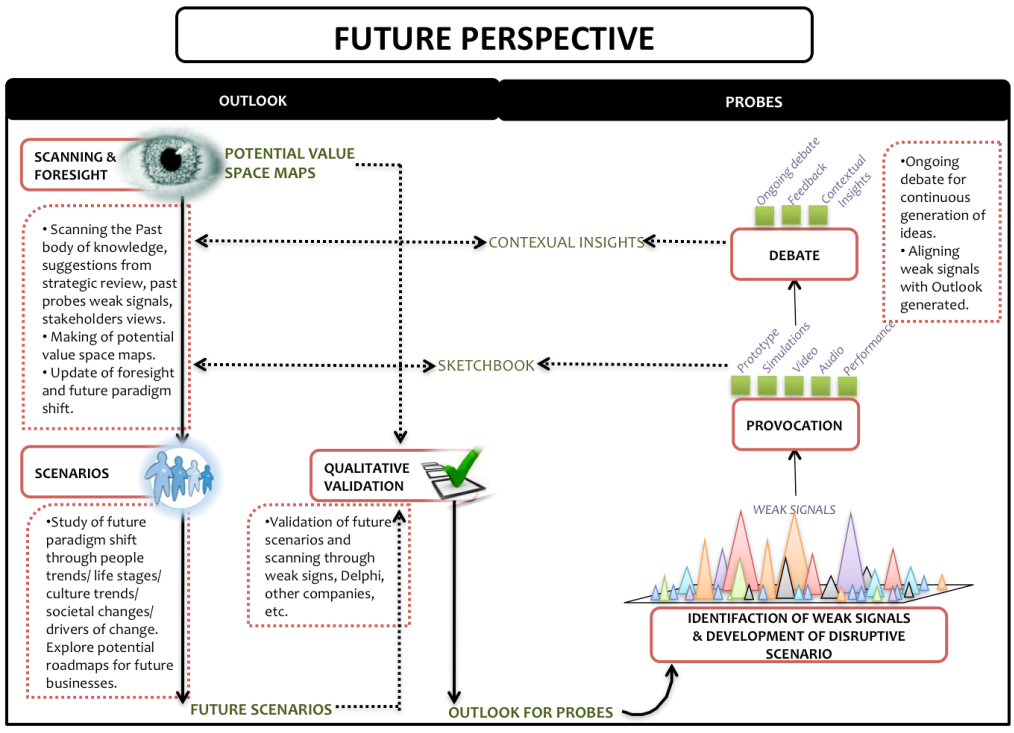

Figure 1.3: Future Perspective: The first phase of innovation process map

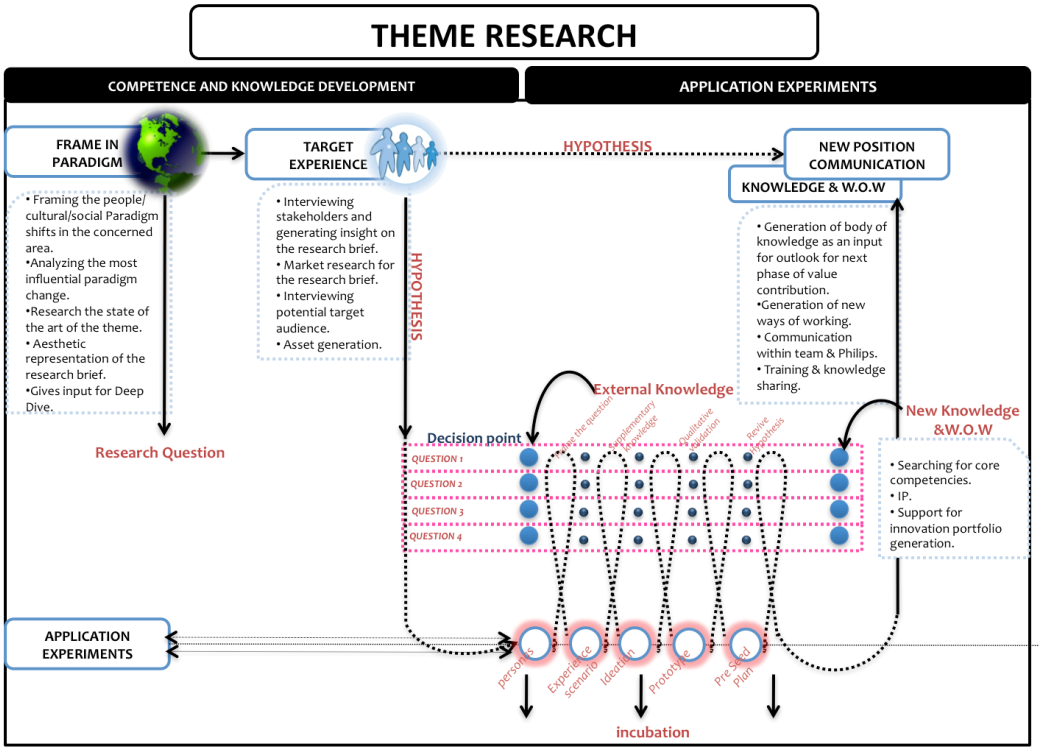

Figure 1.4: Theme Research: Second phase of innovation process map.

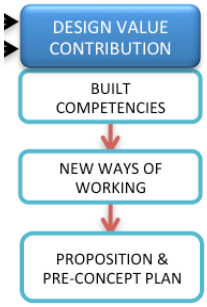

Figure 1.5: Design value contribution: Third phase of innovation process map.

The conceptual maps shown above were transformed into a detailed process map on an Excel spreadsheet providing a description of each step, the mode of communication and the owner for each action (see Figure 1.6). This was done to make the process visually simple for the RD&I team as well as other stakeholders to understand. The innovation process map was also represented graphically (Figure 1.7).

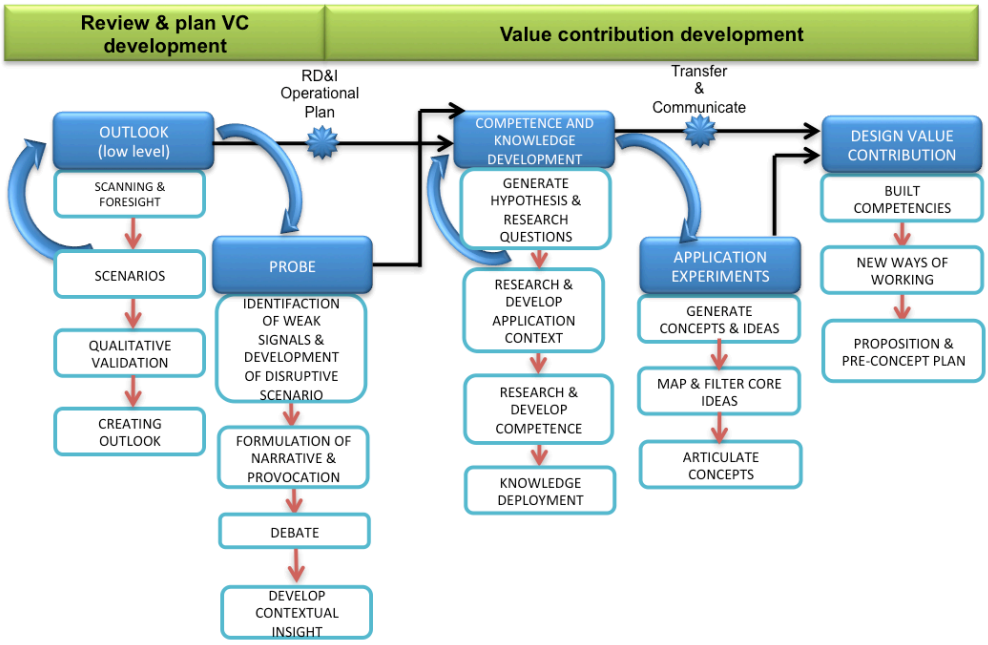

Figure 1.7: Graphical representation of the innovation process map

The process employed to define, refine and map the innovation system is explained in detail in chapter 4.

	Core process name	Focus summary	WHEN - timeframe	HOW - high level / steps	Required Input	Key activities (Philips design) .	Deliverables - output*.	WHO - core or subprocess owner	WHO - other stakeholder(s) / functional contribution	questions/remarks/uncertainties/risks
					FUTURE PERSPECTIVE					
1	**OUTLOOK**	Making sense of emerging landscape	Ongoing yearly outlook and review innovation platforms, followed by annual scanning and probe process.	**Making sense of emerging Paradigm.**	Feedback from PIB/Strategic Review. Past body of knowledge, Past value space mapping through Probes and scanning and foresight. Stakeholder views, previous insights generated through probes.	Insight generation. Making of potential value space map, cultural and people perspective. Explore potential roadmaps for future businesses. Qualitative Validation of road map. Identification of potential future scenarios.	Update of emerging trends to feed in the cultural program. Updated overview of paradigm shift with narrative. Overview of potential value spaces as a document (eg. Ppts). Overview of market opprtunities, technology advancement and potential updated overview of paradigm shift with narrative.	Chief innovation officer, CTO, CMO, CSO, CDO, PIB	Design, strategy, CTO, CMO, CSO(sectors, corporate), PIB.	Addition to value space map if any. Input by the PIB, to avoid themes landing in the middle of the process.
a	SUB PROCESSES		ongoing	**SCANNING & FORESIGHT**	Feedback from PIB/Strategic Review. Existing body of knowledge. Weak signals of change and shifts from past value space mappings/People trends/ life stages/ culture trends/ societal changes/ . Drivers of change and probes.	Insights on possible area for developments based on value space, probes, cultural development. Ongoing analysis. Interview with Philips stakeholders.	Potential Road map.* (**CDM, DM). Short articles for internal reference. (**DM, CDM). Updated foresight & paradigm overview.*(**DM, CDM).	Reon Brand	Philips Design, external network, CSO (sector, corporate), corporate strategy, marketing.	Depending on budget.
b			ongoing	**SCENARIOS**	Potential Road maps, foresight & paradigm overview.	Study of future paradigm shift through people trends/ life stages/ culture trends/ societal changes/ drivers of change. Explore **potential roadmaps** for future businesses.	Future scenarios.*	Reon Brand		
c			Probably qualitative validation can be done at all levels, should we specify it separately?)ongoing	**QUALITATIVE VALIDATION**	Future scenario's.	Validation of future scenarios and scanning through weak signs, Delphi, other companies, etc.	Consolidation of potential future scenarios.* **Articles** to support value space mapping.* (Done by Philips on an Adhoc basis)	Reon Brand		
d			ongoing	**CREATING OUTLOOK**	Body of knowledge. Potential **value space** mapping.	Identification of potential future scenarios.	Contribution to **potential Value space overview/mapping.** **(DM CDM). Outlook for the future. **(DM CDM). Suggestions to Probes. **(DM CDM).	Reon Brand		
2	**DESIGN PROBES**	Provocative exploration that looks at potential long term future. Design research initiative that aims to identify lifestyle scenarios and trends in 'lifestyle scenarios'post 2020 through publication of provocation.	3 months to 1 year on going at a low level.	**Ongoing research activity that uses design provocation to generate public debate.**	Potential road maps. Exploration focus as agreed by the head of strategy & CDO Philips Design. Tapping into the past body of knowledge through Outlook. Identified weak signals, drivers of change, key contexual trends, Paradigms, insights from previous probes, and feedback from the business.	Phases: Identification of Weak signals, creation of narrative, development of disruptive scenarios, production provocation, analysis feedback.	Contextual insights and WIP reporting (sketchbook). Additional: thought leadership, design education, new skill development, IP, new design modalities and languages as appropriate to specific context.	design	CDO (Feedback and selection of key demonstrator for future options).	Budget for experiments??
a	SUB PROCESSES		on going research	**IDENTIFACTION OF WEAK SIGNALS & DEVELOPMENT OF DISRUPTIVE SCENARIO**	Past research in the areas of : politics, economics, culture, environment and technology futures and agreement on exploration focus.	Ongoing research through monitoring unconventional trends outside peripheral vision, identification determininants of weak signals and future tendential shifts.	Weak signals, disruptive scenario that identifies possible provocations.	Clive, Jack	CDO	Informal reporting.
b				**FORMULATION OF NARRATIVE & PROVOCATION**	Disruptive scenario.	Research and experimentation to expose the main determinants to show dependancies between them, production provocation and preparation. WIP project reporting.	Design Provocation, Probe sketchbook.	Clive, Jack		
c			2 to 4 months	**DEBATE'**	Past Sketchbook, design Provocations.	Preparation communication planning and communication material, internal and external communication activities like (colloquim distribution sketchbooks, speaking engagements, seminars, meetings, internet, website etc.)	Feedback from communication exposure.	Clive/Jack	Reon Brand	
d				**DEVELOP CONTEXTUAL INSIGHT**	Feedback.	Interview. Feedback analysis. Prepare the questionaire.	Contextual insight document together with sketchbook uses input for possible Deep Dives.	Reon Brand		
					RD&I Operational Plan (* all steps below are repeated for all the themes). For further detail c excel ppt. theme research 9th february, slide 1)					
					THEME RESEARCH					
3	**COMPETENCE AND KNOWLEDGE DEVELOPMENT**	Building thought leadership.	According to annual planning of innovation program.	**In-dept research in emerging social cultural and anticipated future experience context. Development of research questions that deliver insight and knowledge in themes.**	(*if available) Theme Business position & target audience information from Deep Dives. Defined themes. AOP.	Research briefing, scoping of theme research boundaries, key research questions, Competencies gap analysis.	Identification of the key research question. Relevant Socio-cultural trends. Specific research plan. Supporting feedback from exports. Relevant theme knowledge. Competency development requirements.	Paul Guardien	Design and Market Intelligence.	
a	SUB PROCESSES		4 weeks	**GENERATE HYPOTHESIS & RESEARCH QUESTIONS**	Business position from Deep Dives. Identified research problem.	Research the state of the art of the theme developing. Research brief. Define existing design competencies in the concerned innovation portfolio.	Brief with key design research questions.	CDM of RD&I	Design, CMO/MI,	
b				**RESEARCH & DEVELOP APPLICATION CONTEXT**	Input on social & cultural context and target audience knowledge. Key design research questions with research boundaries and resources.	Identifying design competency gaps & knowledge gaps for the Philips portfolio.	Knowledge on emerging context & target audience. Design competence gap & Competency development map.* (done by Philips design) Design Research plan and scope.* (done by Philips design). Integrated project plan.* (done by PGM). Research report on target group & future context. Theme knowledge.	The triangle & CDM of RD&I	Design, marketing strategy. Geert	Very specific research as per the slected theme.
c				**RESEARCH & DEVELOP COMPETENCE**	Research plan and design competency for the innovation portfolio. Context mapping and insights for knowledge development and competence development. Body of knowledge.	Develop competency training plan. Develop competency modules.	Competence development plan in context of Philips strategy* (done by philipsdesign).	CDM of RD&I	Marketing strategy, Strategy, Marketing , Accounts. Geert	
d				**KNOWLEDGE DEPLOYMENT**	Body of Knowledge and training modules. Competence specification.	Research on generating assets (eg. evidence based proprietary insights,) to support the innovation platforms. Generate body of knowledge.	Deliver & Transfer knowledge through Philips Design channels like cultural program, online, website & word of mouth.	CDM of RD&I	Strategy, marketing, Design, SIB, technology. Geert	*Outsourcing, outide in ideas for aquiring competencies.
4	**APPLICATION EXPERIMENTS**	Develop application concepts to demonstrate business potential of the theme.	According to the theme plan whithin the context of the AOP.		Research question, research brief, research plan, available IP assets. Contexual, knowledge & stakeholder insights and idea selection tool.	Idea filter and mapping. Use insights and knowledge to create people centric business relevance.	Articulated concepts. Potential new venture ideas.	Geert, incubators, sectors	Sectors, incubators.	
a	SUB PROCESSES		According to the theme plan whithin the context of the AOP.	**GENERATE CONCEPTS & IDEAS**	Research question, research brief, research plan, available IP assets, ideation tools & templates.	Ideation based on inspirational knowledge input.	High level/outline of concept description.	Geert	Incubators, seciors.	
b			According to the theme plan whithin the context of the AOP.	**MAP & FILTER CORE IDEAS**	Selection tools and business creation.	Using tools to evaluate business potential. Select concepts and ideas for further development.	Core ideas & concepts.	Geert	Incubators, sectors, business, marketing, strategy. SIB	
c			According to the theme plan whithin the context of the AOP.	**ARTICULATION OF CONCEPTS**	Core ideas & concepts with plans.	Articulation of core concepts (visualisations & demonstrators).	Concrete concepts for new business, product, service or venture.	Geert	Incubators, sectors, business, marketing, strategy. SIB	
					TRANSFER AND COMMUNICATE					
5	**DESIGN VALUE CONTRIBUTION**	Develop propositions based on competencies and concepts developed in design research. Communicate with sectors, incubators and external partners.	For defining new concepts or when a business seeks competence /ideas in an early phase (exploration/deep dive)	**Cooperation and engagement with key business owners/stakeholders. Pre-concept plans explaining the business opportunity. Transfer IP, strategic competences, knowledge and applications to the studios, sectors / incubators.**	Propositions coming out of the earlier phases. Corporate, Sector and Incubator strategic plans and innovation initiatives.	Support the Design Research process with input from the business. Network to enable above. Define new service propositions for the Philips businesses. Application development (with close) involvement Philips Design sector leads) according to PIB innovation architecture.	New business built on definddable IP and competences. Addition to the body of knowledge. New product/service propositions that fit in or lead to a new category or a new venture. Knowledge applications (aligned with mid term product roadmaps) and IP (where appropriate linked to external sources e.g. universities).	Design Research	Design Research, Strategy Offices, Business Development Boards, Philips Research	
a			According to annual planning of innovation program.	**BUILT COMPETENCIES**	Set of competencies and know-how built during theme research and concept development	Allign meetings with people working on theme from the sector, Key people working on competencies and people from the business.	Create a pull by creating awareness of built-up competencies. Push to make sure built-up competencies are used in client projects.	Geert	Design Demand managers, Philips Research,	longer term commitment from relevant business. Follow up to becoming main stream business handled by the studios
b			According to annual planning of innovation program.	**NEW WAYS OF WORKING**	Issues related to the use of existing methods and tools Input from strategy and business development offices.	Identify improvement areas. Scan for existing methods and tools. Align with Business and Technology partners. Develop new ways of working.	New service offering. More efficient/effective ways to generate and develop new propositions.	Geert	Strategy offices, business development boards	funding for running projects using new methodologies (esp. when external tools are needed)
c			According to annual planning of innovation program.	**PROPOSITION & PRE-CONCEPT PLAN**	All assets (IP) generated in the theme research and concept development phases	Proposition / Pre-Concept plan development for incubator and sector business development boards. Create communication material.	Description of the proposition / business opportunity in the form of a pre-concept plan. Proof points of design-led innovation in the form of projectbooks, website, conferences, press release, etc.	Geert	Marketing, Communication, Philips Research	dynamics of the businesses might lead to mismatch in focus or timing.

*typically documents as text & visuals unless otherwise specified.

**CDM is refered to the channel that connects the domain CDM to the sector, DM is refered to the channel that connects to the cultural program.

ABBREVIATIONS

CTO - Chief Technology Officer
CMO - Chief Marketing Officer
CSO - Chief Strategy Officer
CDO - Chief Design Officer
PIB - Philips Innovation Board
DM - Design Manager
CDM - Chief Design Manager

Figure 1.6: Detailed innovation process map in excel sheet

1.3 The Three Innovation Cycles

Design is evolving to cater to the strategic needs of organisations. Organisations have an inherent need for all product and service innovations to successfully make it to market. This generates intense commercial pressure on the internal environment, which is not always conducive to managing change. These advanced technological breakthroughs are not ready for the market yet and need strong socio-cultural research to turn them into mature products. Apart from the above, there is also the strategy of spinoffs and mergers that happens with products that are neither predominantly new to the organisation, nor mature enough to be in the market. These changes have been grouped into three broad types of innovation cycles; *incremental innovation*, *adjacent innovation* and *breakthrough innovation* (Gardien, 2005a, Wuggetzer, 2011, Renner, 2011)

Figure 1.8 shows how Philips Design places these innovation cycles in relation to time (x axis) against market life cycle (y axis) to analyse where new ideas could be placed and what product life cycle it could belong to. On the other hand, a few organisations have put the innovation types (x axis) against time (y axis) in order to analyse where the products will land in the external market and what time line the products must be launched at. For the current research the parameters that have been selected to describe the relationship of the innovation cycles are time (x axis) and market (y axis) (Figure 1.8).

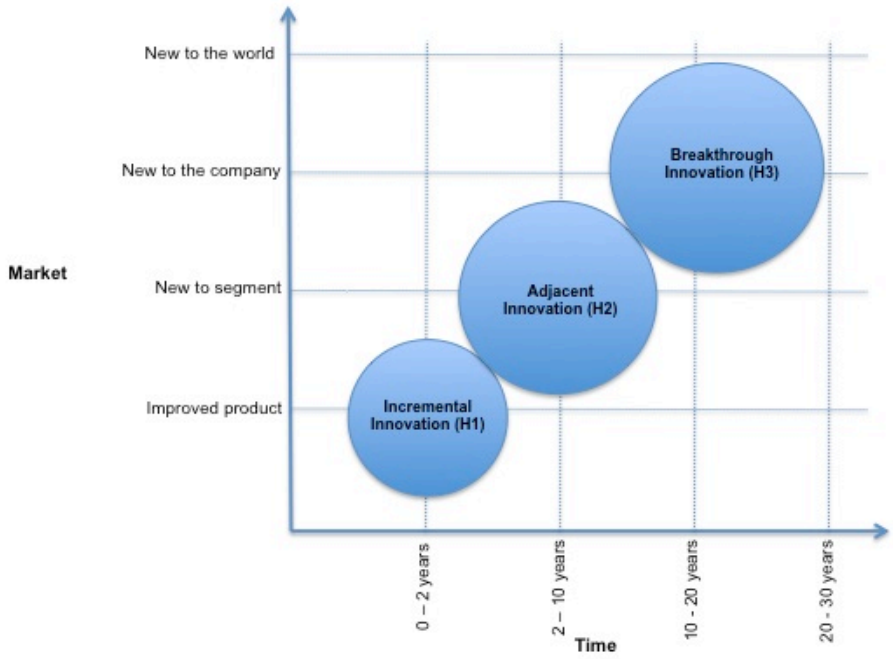

Figure 1.8: Innovation Cycles in organisations (evolved from: (Gardien, 2009, Rowe and Wright, 1999))

These parameters have been selected by keeping in mind the relationship between market cycle and time, and product life cycle and markets, in relation to the organisation's internal environment and external environment. For further clarifications refer to Appendix 19.

The research provides explanation for the existence of a gap between thinkers and practitioners by showing the relationships between human behaviour, organisational culture and business innovation cycles through conceptual diagrams. This is done through graphs by highlighting the influence of time (x-axis) against market (y-axis) and individual expectation in relation to the innovation cycles and Gartner's Hype Cycle. Furthermore, the research explains the corporate culture change and its effects on individual performance and the reason for the existence of the gap through an axonometric graph. This is done by showing relationship between time, market and individual performance in relation with the innovation cycles and the change curve. The research concludes with a three-dimensional conceptual graph illustrating the speed at which teams working in the different

innovation cycles can adopt to the new changes in the internal organisational environment. The above explanations have established new relationships between parameters, which have only been related through qualitative, imaginative and conceptual parameters. These relationships still requires a quantitative enquiry into identifying the ratio each of these theories and variables affect each other.

1.4 Research Story

The Philips Design Innovation process was an outcome of a combination of several domains of literature but no theory could be closely connected to the practice of design at the Philips Corporation. I aimed to drive the research by identifying the closest literature that aligned with the Philips Design innovation process and then extract insights to further develop the theory. During the initial stages of the research programme, I gave a great deal of consideration to the focus of this research and the value being offered through this investigation. As the internship, data collection and investigation progressed at Philips Design I decided to make the 'role of design' within organisations a vehicle with which to investigate broader aspects of organisation practice.

The outcome of the literature search conducted at the start of this programme suggested that no design researcher to date had conducted research with these aims. There was no evidence that a design student has ever been involved in mapping, defining and communicating the process of innovation at a strategic level in the design team of a multinational organisation and used this to extract research questions. With no existing studies on which to base the format of this research programme, the approach has been devised to combine inductive[15] reasoning

[15] Inductive reasoning – Inductive reasoning system consists of a multitude of 'elements' in the form of belief-models or hypotheses that adapt to the aggregate environment they jointly create. Thus, it qualifies as an adaptive complex system, which after some initial learning time, the hypotheses/mental models in use are mutually co-adapted. See: Arthur, W. B. (1994) Inductive reasoning and bounded rationality. *The American Economic Review,* 84**,** 406-411.

(Arthur, 1994) of management studies and abductive[16] reasoning (Pople, 1973) of design thinking within an action research cycle. The abductive approach extracted the logic of 'what might be' and introduced 'insight' as new knowledge occurring outside the premises of the knowledge base. This new knowledge helped in linking different stages of the research intuitively, for example a comparison of the case study, exploration of other organisations and the literature review. Additionally, the inductive approach drew general conclusions from past data developing a logic that identified the findings given within the premises of the research and acted as reasoning to validate intuition coming from the abductive thinking approach. Additionally, the two forms of logic (abduction and induction) were followed concurrently to synthesise the data of the research into a tangible and cohesive knowledge base.

In order to manage the project effectively it was necessary to view the research from different perspectives by exploring the role of design in other organisations. This was essential to compare the role design could play at different levels of organisations similar or in contrast to Philips. This inclusive approach was undertaken to provide an overview of the value of design and the capacity of design as a functional lead in terms of its competencies, capabilities, assets, and stakeholders .It also helped to contextualise the horizontal and lateral influence design has on the strategy of an organisation. Whilst looking at other organisational processes and interrelationships that could support design as a functional lead, it became apparent that the heavy goods organisations identified design as a support function and not a leading function discipline. Therefore, the research tried to gauge how design could influence a broader range of organisations by identifying

[16] Abductive reasoning – It is a basic form of logic inference, which is said to engender the use of plans, perceptual models, intuitions, and analogical reasoning – all aspects of intelligent behaviour that have so far failed to find representation in existing formal systems. See: Pople, H. E. (1973) On the mechanization of abductive logic. *Proceedings of the 3rd international joint conference on Artificial intelligence.* Stanford, USA: Morgan Kaufmann Publishers Inc.

techniques that could help design gain value in the heavy goods organisations as well as improving its functional value in the consumer products organisations.

The study of the role of design in various organisations was devised to further understand the systematic processes, influences, and interrelationships that exist. My purpose was to gain a representative understanding of organisation practice in order to identify opportunities and inform future changes. A key requirement for the research was to gain input from two distinct subjects, the thinkers of an organisation, and the practitioners in the design team. While working with Philips Design, the gap between thinkers and practitioners became evident to me and it was important to identify the cause and solve this problem. The passionate and motivated people working in this team, as practitioners, were inspired to innovate and were excited about opportunities to develop and change. This had enabled the innovation strategies to work without a definition of an explicit process for the past 10 years at Philips Design. My purpose was to try to bridge the gap and make the efforts of the practitioners in the process explicit. Hence, it became imperative to engage these participants (thinkers and practitioners) in the data collection for this programme of research. To gain accurate insights into organisations, I needed to focus on the existing knowledge base that design innovators use to build their capabilities and expertise in leading successful innovation strategies. I considered it vital to gain an understanding of how the design practitioners and thinkers develop and maintain successful strategies and identify the level of reliance on specific tacit knowledge that could be converted from the implicit knowledge[17] that is embedded deep in the roots of design activities in an organisation. This knowledge was gained from the literature research (Chapter 2) and exploration of other organisations (Chapter 6), while participating in conferences related to innovation and idea generation (Appendix 1).

[17] Implicit knowledge – Knowledge in the form of thoughts, skill set, behaviour etc., which is difficult to transfer between individuals in an organisation but is considered vital for the smooth running of the process. See: Reber, A. S. (1989) Implicit learning and tacit knowledge. *Journal of Experimental Phycology General,* 118**,** 219-235.

1.5 Research intent

More research is required into the multiple facets of design and its changing evolutionary character. The state of knowledge in the disciplines studying this aspect of design criticises those who see design as a mere tool that provides aesthetic features to products. The literature does not provide ways to build the foundation of design practice into a more fundamental tool for an innovation process. The intent of this study is to further develop the knowledge of design practice in organisations in order to establish design as one of the credible, essential functions in multinational organisations and to allow it to lead innovation processes at a strategic level.

1.6 Research Audience

There are three significant audiences for this research: *design researchers and educators*, *business researchers and educators*, and *design practitioners*. I anticipated that this study would provide new meaning to the role of design as a leader and a function and not merely as a supporting discipline in big multinational organisations. I intended to make this study into an exciting, persuasive research project and communicate new knowledge, which helps in developing a new area for further research.

The findings of this study will be useful to design researchers and educators because they help articulate knowledge, experience and conditions of design practice to design students. Additionally, the findings will also be of interest to business researchers and educators as, in practice, design works in close collaboration with business strategists and they are an important link to design strategies. The research findings have implications for curricula content that business educators may benefit from reflecting on. The findings from the exploration of other organisations are considered useful for, and of interest to,

design thinkers and design practitioners. The description of the role of design and techniques to improve the value of design provide material and stimulus for practicing designers at a strategic level as well as at the grass roots level to reflect upon their own practice and experiences. By so doing, design thinkers and practitioners may develop a better understanding of their own practice-based knowledge.

1.7 Visualizing The Data And Research Content

The most developmental aspect of this research has been the use of mapping techniques. Mapping techniques are a 'designerly' way of connecting thoughts (Buzan and Buzan, 2007, p. 53 - 57). This process evolved from observation of the subject by using a visual mapping approach, and representing the process with graphical maps. The earlier models provided by Buzan (1989) were 'mapping techniques' to bind the philosophical thinking and literature that I was getting acquainted with. Later the mapping technique helped in making sense of the collected data, and was an important tool for data analysis and coding.

The challenge was to map the data without computer visual data mapping software such as C/C++ programmes, SVM algorithms [39] (Simeon J. Simoff et al., 1998), or other advanced visual computing techniques, as there was predominant use of implicit and qualitative data. This limitation made mapping more difficult but gave me the freedom to experiment. I took inspiration from mind mapping and graphical brainstorming to express my thoughts on paper and learned a lot from work of modern techniques of mind mapping (Buzan, 1995, p. 89-109, Buzan and Buzan, 2007, p. 91-115, Buzan, 1989). These influences made me understand the depth of mind mapping.

The use of mapping and visualization techniques was a central theme in the internship, and 'visual mapping technique' became one of the tools to

communicate the process to the rest of the company. Figure 1.9 demonstrates the visual technique used at Philips Design to make the process easier to communicate to all other departments.

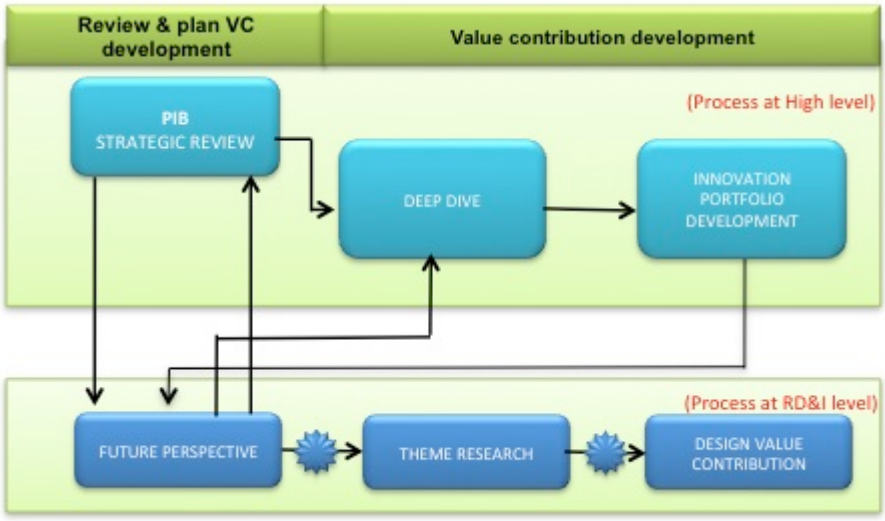

Figure 1.9: Process mapping at Philips Design

This method helped in gaining insight into the minute details of the research, especially in the field of methodological study. It also helped me in connecting the theories and linking the important chronological changes that made design a discipline (Figure 1.10).

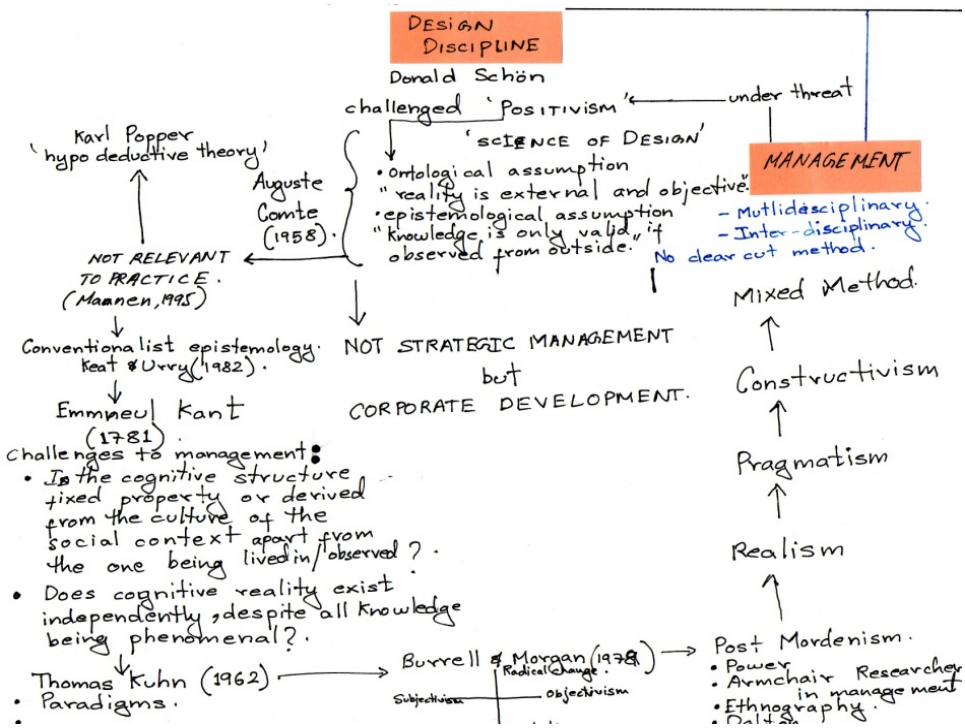

Figure 1.10: Visual mapping in linking the theories

This method of 'visual mapping technique' as showed above displays how I, as a design thinker, accumulated my thoughts and transcribed them in my thesis. The research had gone through a number of iterative loops that affected the final outcomes. The 'visual mapping technique' helped me understand the directional flow of my data throughout the three years of my PhD.

1.8 Research Aims and Objectives

The intention and purpose of the research was to see if design could play the role of a functional leading discipline within a multinational organisation and lead an innovation process at the strategic level while holding the role of a functional leader. The research seeks to provide ways to transform the role of design into being the functional lead in an organisation and identify the problems associated in doing so, thereby improving our knowledge of this phenomenon by giving a more complete and representative account of designs activities.

The research in the first year focused on mapping an innovation process run by design at the strategic level in Philips Design. This process was being followed in the organisation on an ad-hoc basis with tacit communication for the last 10 years. At that point the aim was to develop an effective mapping of a complex innovation system in a multinational organisation from a design case study perspective. By the time the mid-term progress review of the research took place the aims of the project had evolved, namely to improve the potential of the outcomes, while still retaining the original intention of the research. The broad aims are described below followed by the objectives devised to achieve them;

Aim 1: Identify the closest literature related to describing design innovation strategy in practice and establish the correlation of theory in the literature with practice.

- Make distinctions between theory and practice.
- Develop the theory further through robust knowledge and processes examining practice to better contribute to the theory of practice of innovation through design.

Aim 2: Provide techniques to support design as a functional lead in organisations and be able to lead an innovation process.

- Articulating challenges in practicing effective innovation.
- Developing resources to stimulate a design driven innovation process in a corporation.
- Articulating techniques to execute effective techniques for design to drive the innovation process in a corporation at a strategic level.
- Defining platforms to run the innovation process to ensure maximum business motivation and growth.

1.8.1 Important Definitions

There are a number of key terms that are used throughout this thesis; they have been defined below to clarify how they have been applied;

Philips/Philips Corporation – a term used to define the organisation Philips B.V. in Netherlands as a whole entity.

Philips Design - Philips Design specifically indicates the Research Development and Innovation team (RD&I) and the design function within Philips corporate.

Functional leadership - Functional Leadership is a term used in corporate organisation to denote a discipline that is recognised for making decisions that impact on the strategic function of the organisation. A department in the company that performs the functions associated with the role of the leader as a group.

Support function – Is the act of supporting the business decisions. It is done by providing value as desired by the functional leaders for differentiation of the product from its competitions. Generally this is a role played by design in most organisations.

Thinkers – Individuals working with strategies and solutions to the problems that are applicable in 20+ years. They are involved in the formulation of the future of the company as well as the direction of the team.

Practitioners – Individuals working for the scenarios applicable in the present in terms of products and services. They follow the direction of the thinker to achieve the goal of the future.

Delphi Technique – Originally, a structured communication technique developed as a systematic, interactive forecasting method, which relies on a panel of experts. For the case study the Delphi technique was adapted to fit the requirements of Philips Design. The participants were given flexibility in regards to being present for the meetings. The adapted technique also involved one-on-one interviews with each missing participant, the data of which was included in each consecutive session of Delphi meetings.

These terms above have been used extensively throughout the thesis and are repeated where applicable through footnotes.

1.8.2 Selection Criteria for Other Explored Organisations

The selection of other organisations was a crucial task for the success of the study. This selection process was subject to a number of limitations. Firstly, the participants required for interviews were not easily available nor did they have the authority to share the commercially sensitive information about the strategic decision making process. Secondly, most multinational organisations did not use design at the strategic level as they were driven by technological research and development or new market opportunities. Thirdly, organisations were not encouraging innovative research due to external economic turmoil. Lastly, due to the involvement of highly confidential data of a number of multinational organisations a number of ethical considerations played a role in choosing the organisations.

Post Philips case study, the criteria for selection of the three other organisations were that they must:

- use design at the strategic level in the decision making process
- have an innovative, creative portfolio driven by design, and
- have a complex innovation system comparable to Philips.

Due to ethical and fundamental limitations it was not possible to gather information on the organisations' internal structure and corporate strategy before obtaining their consent, hence making it impossible to select organisations based on the above criteria. Additionally, permission had to be granted for publication rights of all material included in the thesis. As a consequence, the criteria for selecting the organisation changed. During the process of selection I was introduced to the

'golden circles' of Sinek (2012). Hence the inspiration for making the criteria for selecting three other organisations for the exploration purpose of the research was taken from these 'golden circles' (Figure 1.11).

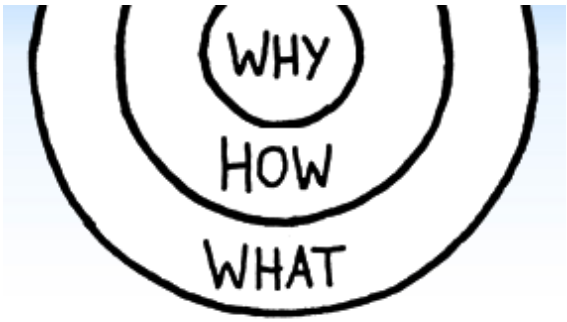

Figure 1.11: Golden Circles by Sinek (2012)

Sinek (2012) provides a model that codifies three distinct and interdependent elements—*Why*, *How* and *What*—that pushes any person or organisation's function to work at their highest capability. Based on the biology of human decision making, it demonstrates how the function of our limbic brain and the neo-cortex directly relate to the way in which people interact with each other and with organisations and brains in the formation of cultures and communities (Sinek, 2012).

The issues related to innovation driven by design has been directed towards inspired individuals who think, act and communicate in the same way and drive the company towards a level of diffusion that is difficult for competitors to copy. While selecting these organisations, I did not take into account what they made but started with the question 'why' and 'how'. The chosen organisations therefore had strong strategic management keeping the 'why' aspect loud and clear throughout the organisation. This 'why' aspect was reflected in the organisation's mission statement and resonated through the next two layers of the circle ('how' and 'what'). The 'how' aspect justified the way organisations turned their beliefs into reality for their customers and produced an innovative portfolio that ultimately resonated as (products and services) as the 'what'.

The following selection criteria were used to select three organisations out of various possibilities that were suitable to explore at a strategic level in comparison to Philips Design's Innovation policies.

- *The 'why' question*: Why are they doing what they are doing? This criterion allowed me to choose the organisations that were not just making products but believed in what they were doing through a strong mission statement and having a strong philosophy despite being challenged by competition similar to Philips, who hold their ground to make products that are sensible and simple.
- *The 'how' question:* How do these organisations make decisions? This criterion allowed me to choose organisations based on their process of new idea generation and innovation. Philips had a strong functional leadership programme that runs parallel and enables cross-functional, business and sector innovation. Philips uses design as one of its functional leads to develop and propose value competencies and create a strong innovation portfolio by making them a part of their development of functional leadership (DFL) process plan. The organisations that have been selected have similar processes in place for making important decisions. Irrespective of the role design plays in the organisation, the way they innovate is either similar to or in contrast to Philips Design.
- The *use of design in the organisation* is an imperative that led to choosing them as samples for this research. Philips Corporation was trying to push design as one of the functional leading disciplines, though it was not possible to identify other organisations who give design this status, the chosen ones did give design importance where innovation was concerned.
- Last but not the least, the *availability of the organisations* also played a part in choosing them for this study. Instead of contacting them independently, I chose to go to conferences that the targeted people were

presenting at and interviewed them. Although I had the opportunity to interview a number of organisations the criteria did not allow all of them to be the subjects of the exploration.

The above criteria were used to select Companies A, B, and C.

1.9 Research Design

The research design for this project's empirical study can be summarized as follows:

Epistemology – Constructivism (Glanville, 1994, Glanville, 1997, Glanville, 2005).

Ontology – Post-modernism (Burrell and Morgan, 1979).

Methodology – Case study methodology (Yin, 2003) with a loop of reflective practice (Schön, 1983).

Phenomenon under study – Role of design in organisations. This defines the context of the organisation under study.

The selected cases – Philips Design: A consumer goods company based in Eindhoven, The Netherlands.

Company A: A mobile phone manufacturing and distribution organisation based in Finland.

Company B: An aircraft manufacturing company based in Germany.

Company C: An automobile manufacturing company based in Germany.

Data type – Qualitative.

Data collection method – Case study, Semi structured interviews, Delphi technique, and open-ended questions (audio recorded and fully transcribed).

Analytical method – A design oriented, mapping technique based on cross organisational triangulation with a third party expert who has a good experience of how Philips Design works and also knowledge of other innovation archetypes globally.

1.10 The Thesis Structure

This thesis is as follows:

Chapter 1	Introduction: the study's focus, audience, scope, aims, objectives and significance.
Chapter 2	Literature review: correlation of the study's central argument and theoretical foundations with existing literature.
Chapter 3	Methodology and methods used: the rationale and plan for this projects empirical study.
Chapter 4	Case study: Description of work done at Philips Design.
Chapter 5	A review: further review of the book 'Design driven innovation' by Roberto Verganti as the closest related literature to practice.
Chapter 6	Exploring other organisations: narrative of design structure in all the organisations that were explored.
Chapter 7	Data gathering analysis: design techniques used in data analysis and data gathering.
Chapter 8	Findings: the key findings at different stages of the research.
Chapter 9	Discussion: relating the findings from the data analysis to design theory and a statement of the contributions the research makes to new knowledge.
	Bibliography
Chapter 10	Appendices

LITERATURE REVIEW

CHAPTER TWO: SCOPING THE PROBLEM AREA

This chapter provides the theoretical framework for the study. It is divided into two broad sections; first one highlights the domain of functional leadership of design[18] using current literature to explain dimensions of design in organisations. Second, highlights the dynamics of internal cultural change and how innovation drives through these changes affecting the different dimensions of one organisation including design.

In the first section I have attempted to define strategic level functional leadership. Scoping strategic leadership and the existing practices by aligning theory that identifies the meaning of functional leadership and how it translates into design. I also provide the glimpse of the role design plays in organisations currently and how these roles are being transformed when applied to strategic innovation processes.

In the second section I talk about organisation change and influence of people, groups and/or culture on the intensity of change. The chapter closes by connecting the role of design thinking with organisational change. It provides evidence for design to be an important source to lead organisational change keeping the fundamental elements of time, space, and people together aligning it to the level of strategic leadership.

Additionally, a separate chapter (Chapter 5) has been dedicated to the book; Design Driven Innovation, by Verganti (2009). Verganti's work has been separated to highlight the similarities, differences and gaps between the application of the theory into practice in the RD&I innovation strategies. Excerpts of Verganti's texts are highlighted in the coming paragraphs to link it to the overall theoretical

[18] Design – I have used the word design not in the traditional sense of making, styling and doing creative things. I have used it to mean a multidisciplinary activity done at the three levels of organisation involved in creation, synthesis, and exploration.

framework for the research. This has been done to provide an exclusive platform for the discussion of Verganti's theory in relation to its practice at Philips Design.

2.1 Scoping Strategic Level Leadership

> *It is possible—and fruitful—to identify major events that have already happened, irrevocably, and that will have predictable effects in the next decade or two. It is possible, in other words, to identify and prepare for the future that has already happened. - Peter Drucker, 1997.*

Strategic management has evolved from the discipline of economic theory in a response to the frustrated managers who were limited in running their businesses with the help that theories of economics provided them. Faulkner and Campbell (2003) state that strategic management evolved as an answer to,

> *"Achieve company's objectives, and adjusting the direction and methods to take advantage of changing circumstances."*

This subject was initially taught under the banner of business policy and it was only after 1950 that strategic management was an established discipline. In the past 20 years researchers have begun to pay attention to the study of strategic management, which is viewed as a critical aspect of an organisational success (Finkelstein and Hambrick, 1996). Contradicting, Nag, Hambrick et. al. (1995) believe that this field lacks reasonable identity as its definition intersects with other fields like sociology, marketing, psychology, and finance. It is also claimed that strategic management is flooded with implicit definitions which are expressed explicitly by scholars coming from other fields through the use of various methodologies (ibid). Nag, Hambrick et al. (ibid p. 946) have broadly aligned the definitions of strategic management from the field of economics, marketing, sociology and management and arrived at representative definitions. The most

relevant of which to the present study is coming from the field of management that is;

> *"[Strategic Management] is developing an explanation of firms performance by understanding the roles of external and internal environments, positioning and managing within these environments and relating competencies and advantages to opportunities within external environment. Strategic management is the process of building capabilities that allows a firm to create value for customers, shareholders, and society while operating in competitive markets. [It is] the study of decisions and actions taken by top executives…for firms to be competitive in the marketplace."*

The above definition points out at an important aspect of strategic management, which are its top executives. Strategic management is closely related to the concept of strategic leadership[19] of the management bodies existing above operational level[20] of an organisation. Finkelstein, Hambrick, et al. (2009, Cited in Slawinski, 2007, p. 344) and (Daft, 2005) broadly aligned, strategic leadership to the study of executives who have the over-all responsibility for the firm and how their decisions affect organisational outcomes. The focus has shifted to top managers and teams[21] because they usually have decision-making responsibilities that affect the whole organisation – including other members of the organisation and its overall

[19] Strategic Leadership – This research uses strategic leadership to explain management of an entire enterprise; applying to decision-making responsibilities. The parties who are involved in the aspects of strategic leadership are individuals [e.g. CEOs or divisional general managers], groups [top management teams], or other governance bodies [board of directors]. Chandler, A. D. (2003) *Strategy and structure: Chapters in the history of the american industrial enterprise,* Washington D. C., Massachusettes Institute of Technology.

[20] Operational level – This level of management is concerned with the implementation and control of the everyday activities of the organisation. These activities are highly dependant on internal information, have high response in real time, and are transferable into computer based information systems. Anon. (2008) *Annual report and registration document* [Online]. Munich: EADS. Available: http://2008.reports.eads.net/2008/en/book1/6/3/2.html [Accessed 26th February 2010 2010].

[21] Top Managers and teams – It is composed of the key individuals who are responsible for selecting and implementing the firm's strategies. Predominantly it is heterogeneous in nature, as it comprises of individuals with different functional backgrounds, experience, and education. Merson, R. (2011) *Guide to managing growth: Strategies for turning success into even bigger success,* New Jersey, John Wiley & Sons, Inc.

performance (Slawinski, 2007). According to Kessler and Chakrabarti (2010, p. 1145),

> *"Organisations and the environments, in which these executives work, are very complex and ambiguous. Strategic leaders are expected to navigate through these complexities and develop strategies that will allow the organisations to be successful."*

Another study on strategic leadership by Ireland and Hitt (1999) claims that specific activities and behaviours of the leaders can improve the success of the firm. Ireland and Hitt (ibid p. 63), describe these activities by stating,

> *"Ability to anticipate, envision, maintain flexibility, think strategically, and work with others to initiate changes that will create a viable future for the organisation".*

Ireland and Hitt (ibid) identified six components of strategic leadership that would lead to enhanced organisational performance: determining the firm's purpose or vision; exploiting and maintaining core competencies; developing human capital; sustaining an effective organisational culture, identifying ethical practices and establishing balanced organisational control.

Kotter (1998, p. 42) put a lot of emphasis on the act of 'setting direction' being different from 'planning'. He says,

> *"Setting a direction is more an inductive process where leaders gather a broad range of data and look for patterns, linkages and relationships that help explaining things. The direction setting aspect of leadership doesn't produce plans; but creates vision and strategies. People who articulate these visions*

aren't magicians but broad-based strategic thinkers who are willing to take risks".

Another important aspect of strategic management are the different levels of the organisation. All decisions and plans made at the strategic management level by the strategic leaders are connected throughout internal and external environments of the organisation with help of the structure of communication channels. Vyuptakesh (2008, p. 362-363) identifies four hierarchical planning at strategic level; strategy at international level, strategy at corporate level, strategy at business level and strategy at departmental level. Further he elaborates that,

"The efficacy of the departmental level strategy is a prerequisite for sound corporate level/business level strategy."

Additionally, all organisational structure has several different ways in which they arrange their departments[22]. Vyuptakesh (2008, p. 371-372) provides four structures that could support multinational organisations; product structure, area structure, customer oriented structure and functional structure (Figure 2.1).

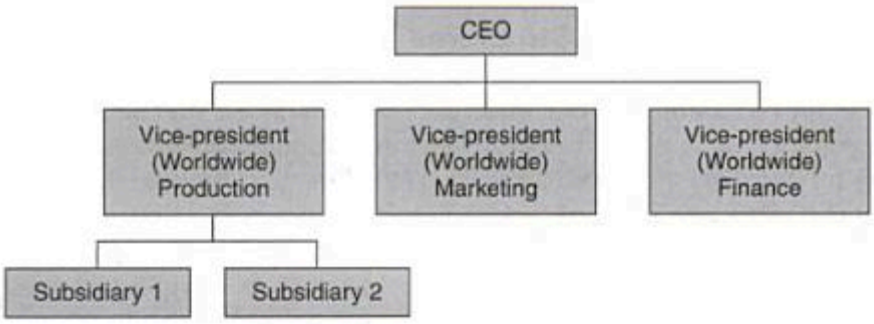

Figure 2.1: Global Functional Structure (Kellert, 2008)

[22] Departments – They are the entities organisations form to organize people, reporting relationships, and work in a way that best supports the accomplishment of the organisation's goals. Departments are usually organized by functions such as human resources, marketing, administration, and sales. Dealtry, T. R. (1992) *Dynamic swot analysis: Developer's guide,* Burmingham, DSA Publications.

Whilst functional organisational structure groups together the strategic, business, departmental and operational levels by consolidating all activities, it might end up slowing the innovation speed[23] in the long run due to lack of horizontal alignment between functions (Porter, 1985). Daft et al. (ibid, p. 114) identify the need to support the organisation running on functional leadership with other structures. They choose matrix structure to be most suitable. They state;

> *"When it is assessed that functional, divisional and geographical structures combined with horizontal linkages mechanisms are not working effectively, the matrix may be adopted as a remedy. […] The matrix formalizes horizontal teams along with the traditional vertical hierarchies and tries to give equal balance to both."*

Schwalbe (1965) supports the proposition provided by Daft et al. (1985) that organisations use different combinations with functional organisational structure for example project organisational structure or matrix organisational structure to enable horizontal coordination between functions.

The above discussion makes it clear that management of strategic leadership requires support from its managers[24] and functional managers[25] to adhere to the company's vision and mission statement and upheld the values while doing business. Thompson and Martin (2010, p. 402) add that,

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[23] Innovation speed – A theory of 'speed of innovation' as a key tool to a firm's goal of creating and sustaining competitive advantage amidst rapidly changing environments. The paper provides support to this argument. See: Verganti, R. (2010) *Changing the rules of competition by radically innovating what things mean* [Online]. Harvard: Harvard Business Press. Available: http://www.designdriveninnovation.com/ [Accessed 4th November 2010 2010].

[24] Managers – Individuals who bear responsibility for the overall performance of the company or for one of its major self-contained subunits or divisions. See: Best, K. *Design management: Managing design strategy, process and implementation,* Switzerland, AVA Publishing SA.

[25] Functional Managers – Individuals responsible for supervising a particular function, that is, a task, activity, or operation, such as accounting, design, manufacturing, resource and development [R&D], information technology or logistics. See: ibid.

" ...Major responsibility of the strategic leader is a system of communications which first enables managers throughout the organisation to be strategically aware, and second ensures that the strategic leaders stays informed of the changes that are taking place."

What's crucial about vision is not its constituency or how mystical it is but how well it serves the interests of its important constituencies – customers, stockholders, employees – and how easily it can be translated into a realistic competitive strategy (Kotter, 1998). Strategic level management is based on two important aspects; first, are the strategic leaders who envision the future of the organisation and align the managers and functional managers to the vision; second, are the structure of the organisation that makes the navigation of decision and planning made at strategic level easy through all its internal and externals environments. Whilst strategic leadership describes the mechanisms of top executives, there are other forms of leaderships supporting the structure of the organisation that need to align with strategic management. The one most important to this study is functional leadership explained in detail in the following sections.

2.1.1 Functional Leadership

Leadership is action, not position. - Donald H McGannon, 2011

First developed at Royal Military Academy, Functional Leadership training was a part of a programme that trained officers the responsibilities of leadership. The training was transferred to the organisations and was famously known as Action-Centered Leadership (ACL, #264). Adair (1990, p. 9) provides the initial theory for action-centered leadership and states that,

"...I have developed the idea that working groups resemble individuals in that although they are always unique…yet they share, as do individuals, certain

common 'needs'. There are three areas of need present in such groups. Two of these are the properties of the group as a whole, namely the need to accomplish the common tasks and the need to be maintained as a cohesive social entity… The third area is constituted by the sum of the individual needs of group members."

Adair (ibid p. 13) identifies that the three areas of need overlap and influence each other. He mentions,

"The value of the three overlapping circles is that they emphasize the essential unity of leadership: a single action can be multi-functional in that it touches all three areas."

Adair (ibid p. 13), penned down a single list of leadership duties representing its functional characteristics. He claims that the list would help in navigating through the overlap of group needs and individual needs. This list was adopted from the Royal Military Academy, Sandhurst, which has been useful in many other organisations. Adairs (ibid) list indicates the following;

"The list of leadership functions[26]*:*

- *Planning*
- *Initiating*
- *Controlling*
- *Informing*
- *Evaluating*

"

[26] Functions – (noun) used to describe an action or activity proper to a thing, or institution; the purpose of which something is designed to exist; role. See: Adair, J. (1990) *Leadership and motivation: The fifty-fifty rule and the eight key principles of motivating others,* London, Talbot Adair Press.

Since Adairs (ibid) version of action-centered leadership/functional leadership theory scholars have interpreted it differently. Zaccaro and Klimoski (2001, p. 24) identify three relationships to the success of functional leadership and other models of team leadership. The first, focuses on functional leadership as a boundary role linking teams to their environments; the second, suggested that leadership functions are necessary when there are problems within the team, and the third, functional leadership is defined by behaviour that assists the team in problem solving (2001, p. 24). Zaccaro and Klimoski (ibid) developed a framework that states;

> *"Leadership influences team effectiveness via its effect on team processes. i.e., cognitive, motivational, affective and coordination". The leader functions that have an impact on team effectiveness are:*

- *Information search and structuring,*
- *Information use in problem solving,*
- *Managing personnel resources,*
- *Managing material resources."*

Air Training Corporation (2010), another company that is using functional leadership in its strategic management states that,

> *"The functional approach to leadership is the ability of a leader to manage a group to complete a task whilst keeping the group working as a team or developing the group into a team and satisfying the requirement of the individual group members".*

The Air Training Corporation ((Atc), 2010) say that to enable a successful application of the theory, the leader has to divide their time between the three areas

noted by Adair (1990) i.e. the task, the team and the individual. These are known as the areas of need (Table 2.1).

Task Needs	Team Needs	Individual Needs
Appreciating the situation	Control of Quality / tempo	Motivating, praising
Making / adjusting the plan	Communications	Giving sense of purpose
Allocating work / resources	Standards	Giving Status
Control of quality / tempo	Discipline	Training
Communications	Building team spirit	Recognising and using individual abilities.
Standards	Motivating, praising	Attending to personal problems.
	Giving sense of purpose	
	Giving Status	
	Training	

Table 2.1: Three important Area of needs (2010)

Where Kotter (1998) believes that generally leadership connects the vision of a leader to the alignment of employees at the bottom of the hierarchy; Musa[27] (2010) develops on theory provided by Dreikorn (1961) and claims that functional leadership theory is a model that concentrates on how leadership occurs. Dreikorn[28] (1961) stated;

[27] Musa, M. (2010) Analysing leadership theory in a social psychological perspective. *In:* Astuti, D. S. R. (ed.). Bandung: Padjadjaran University. A PhD student in Indonesia researches on adolescent sexual behaviour, in relation to value-systems. His paper on functional leadership is relevant to the study and has thus been used extensively. However, I would like to agree that the context of his study is different from the current research.

[28] Dreikorn, M. J. (1961) Integration. *In:* Dreikorn, M. J. (ed.) *The synergy of one: Creating high-performing sustainable organizations through integrated performance leadership.* Milwaukee: ASQ. – There is a lack of horizontal alignment between functions in an organisation when it is structured under functional leadership. This theory provides tools

> *"In the functional leadership model the functional disciplines are enablers, not executers, of process…with the functional disciplines and process executers aligned throughout the processes, their primary focus is consistency in action, integration throughout the system, and sustainability of performance."*

Additionally, Musa's (2010, p. 3) theory on functional leadership is not particularly convincing as he uses it in a different context, nevertheless it is closest to the theory being stated in this study. He defines the types of behaviours that guide an organisation and then looks as how those behaviours occur. Under this model, leadership is a distributed function. Musa (ibid) describes the important aspects of functional leadership theory as: fixed definition of the group, leadership and effectiveness as they move hand in hand to give leadership a wider meaning. In addition to Musa's theory, the Air Training Corporation (2010) identifies that; a task, a team and a leader are the three important ingredients for functional leadership to work effectively. Musa (2010, p. 4) claims that,

> *"People at all levels can participate in guiding the organisation. One of the cornerstones of this model is its focus on 'how' instead of 'who'. The model that focuses on who leads, tends to look at the person with formal authority in an organisation…The functional leadership model looks at how decisions are made even when there is no single person who is acting as a leader. By focusing on the function of leadership, it is easier to see what stimuli is influencing the behaviour of the organisation even if the input is coming from informal and unlikely sources."*

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like 'homeroom leadership' for the alignment to be made possible while maintaining the characteristics of functional leadership structure.

Functional leadership theory is very commonly used in practice in organisations like Lufthansa, Philips Design, and Company A though might not be known by the same term. For design to be a recognised functional leader it needs to align its activities and contribute to the strategic level planning. It is imperative for the research to scope the current influence of design's role at strategic level of an organisation in theory and its practice.

2.1.2 Scoping Design at a Strategic Level

Design provides the benefits of creativity (Fujimoto, 1990), interpretation (Schmitt et al., 1995), communication (Trueman and Jobber, 1998) and integration (Nelson and Winter, 1977, p. 150) beyond just observation, and makes the observations and explorations visible to the organisation. Trueman and Jobber (1998) grouped the role of design in an organisation into four dimensions; value, image, process and production. Here 'value' represents product quality. 'Image' is the visible link between product and customer; 'process' describes the product life cycle from idea generation through development and launch to maturity, decline and regeneration. 'Production' is associated with product engineering, materials and technology. All four dimensions can be compiled in a new product strategy, which can capitalize on a whole spectrum of design attributes at a number of different levels in an organisation.

Management theorists March (Cited in Martin, 2009, p. 19) has identified two activities that organisations might engage; primarily in exploration, i.e. the search for new knowledge; and secondary, in exploitation and the maximization of payoff from existing knowledge. Both activities can create enormous value and are critical to the success of any business organisations. But they are hard to engage in simultaneously and organisations choose to focus on one of the two activities (ibid). Buganza and (2006, p. 393) believe that businesses that balance exploration and exploitation continuously looking back at their past channels of knowledge to the

next significant challenge and driving across these channels, in a steady cyclical process become design-thinking businesses[29] .

Many businesses follow a common evolutionary path in making decisions about their strategy. According to Martin (2009, p. 18),

> *"The company is birthed through a creative act that converts a mystery to a heuristic through increasingly persuasive analytical thinking and enters a long phase in which the administration of business dominates".*

Mintzberg (1994) argues that formulation of strategy is like a craft activity, and managers and strategists are craftsmen making strategy their clay. The strategic objective of almost all corporations is to achieve a sustainable competitive advantage, which gives them a unique position in relation to their competitors. A good strategy reflects on good business. Martin (2009, p. 20) claims;

> *"To be successful, a business must perform three activities of namely; organize, satisfy needs and earn a profit."*

Design has been famous for two predominant roles at strategic level of an organisation; first, for being product and services differentiator and second, providing valuable contributions of design to organisational structure. Regrettably, Stevens et al. (2008, p. 2) state

> *"...Much business strategy literature predates or neglects these trends, and in the empirical literature of design management they are often discussed under*

[29] Design-thinking – The notion of design as a way of thinking can be traced back in writings of Herbert Simon See: Simon, H. A. (1957) *'A behavioral model of rational choice' in his models of man,* New York, Wiley. Design thinking is explained as the way of solving ill defined problems, gathering data, exploring new boundaries, planning, synthesizing in the field of design and architecture. See: Brown, T. (2009) *Change by design,* New York, Harper Collins Publishers. & Buchanan, R. (1992) Wicked problems in design thinking. *Design Issues,* 8**,** 5-21.

the catch-all of 'strategic design'... Design's value has typically been recognised as coming mainly from industrial design practice in operations and product development."

As stated earlier the concept of 'differentiation by design' used as a strategy by organisations dealing with premium goods only is now spreading towards the world of mass marketing. Lorenz (1988, p. 31) exclaims,

"There are a few companies that have gone even further. They have recognized the central role design can play and have incorporated industrial designers in unique catalytic roles".

Lorenz (ibid p. 33) gives the example of the chief design officer for Sony in 1980's who had been given an additional duty of coordinating the developments of products. This showed that industrial designers in their most traditional sense were highly multidisciplinary and could play the role of unique glue for a corporate process of product development. Lorenz (ibid p. 34), also explained the importance of design in a marketing driven organisation by stating that,

"The clear message for all is that, for a company to develop a fully fledged 'marketing imagination', and to exploit it to its utmost, it needs to upgrade its use of design".

Further Lorenz (ibid p. 34) stated that,

"In the increasingly global marketplace, the achievement of meaningful distinction requires the company to make all sorts of connections".

The ability to make connections between form and function can be done successfully by industrial designers due to their imagination and synthesizing skills.

Entrepreneurial drive is equally important as the tools of the engineer, the financial controller and the marketer (Levitt, 1983, p. 1). Levitt (ibid) supports Lorenz's argument by stating,

> *"The search for meaningful distinction is a central part of marketing efforts."*

Ford and Randolph (1992, p. 267-294) including others have specifically described industrial design as 'translators, bridges and catalysts' between marketing and the various types of engineers.

Steven et al. (2008) believe that greater value of design is distributed in organisations through its specialities like graphic design, interaction design, industrial design etc. Designs contribution to product development and differentiation through other specialisations are predominant. What is not yet exercised in organisations is designs ability to influence strategic planning and organisational structure. Lorenz (1994, p. 80) saw the benefits of application of industrial design in strategy. He suggested, strategic design,

> *"Integrates industrial design more deeply into the company...Design effort is devoted to such broad activities as lifestyle research, in order to anticipate product concepts ahead of competitors."*

Morzota (2003, p. 94) elaborated on value generated by design at three levels in an organisation. They are;

> *"*

- *By optimizing primary activities: design action on consumer perceived value.*

- *By optimizing the coordination among functions and the support activities of the firm: design as a new function in the structure that transforms the management process.*
- *By optimizing the external coordination of the firm in its environment: design generating a new vision of organisation."*

Man and Jung (2008, p. 59) add a notion of design being used as a consultant and push forward the concept of top-down leadership. Today, bottom-up leadership is favoured where employees lead the innovation thinking by generating ideas. This process is very similar to 'Thought Leadership[30]' where employees push boundaries and turn vision into reality. When design is used as a consultancy it has a different way of working from when it is a part of the internal structure of an organisation. Man and Jung (ibid p. 59) state;

> *"In the field of design, top-down leadership is unfortunately more commonplace. Design decisions tend to belong to the client, and the designer is the provider."*

Man and Jung (2008) have highlighted the use of design leadership as a strategic tool while design is a consultant in leveraging how innovation might drive growth. Additionally, Stevens et al. (2008, p. 5) propose that design could lead at the strategic level while being a part of the internal corporate structure, in three ways. First, competing by 'high design[31]' to be at the strategic level. Second, use of integrated design approach to help implement strategic positioning. And third,

[30] Thought Leadership – Explained by Man and Jung Man, K. Y. & Jung, M. J. (2008) Bottom-up design leadership as a strategic tool. *Design Management Review,* 19**,** 59 - 67., is about championing new ideas other than managing people or helping a group achieve a goal. Mostly it works on a bottom-up leadership approach.

[31] High Design – Reflects on the activity of use of design to command high prices. This is usually done by emphasizing it as luxury or exclusive and is often based on aesthetic qualities rather than functional ones. See: Stevens, J., Moultrie, J. & Crilly, N. (2008) Designing and design thinking in strategy concepts: Frameworks towards an intervention tool. *International DMI Education Conference.* ESSEC Business School, France: University of Cambridge.

design methods (commonly known as ‘design-thinking’) can inform strategy formulation.

The above arguments have highlighted the role design plays at the strategic level. Design is also seen contributing at other levels of the organisation decision-making. These roles of design reflect on how ‘designers’ work and add value through their creative competencies.

2.1.3 Domain of Design’s Role in Organisations

Design works with ‘values’ implying, both aesthetic as well as commercial values, which is interpreted and communicated to the right audience. For customers value is conveyed through a positive product experience and lasting brand loyalty, for partners and stakeholders it is conveyed in the form of on-going profitability and financial return on investment in the company (Bernstein, 1988, p. 204). Bernstein (ibid) sees the designers similar to a writer; both the writer and a designer possess insight and try to communicate that insight through their special skills. A designer is concerned with another important factor when he/she is communicating to his/her audience, that is ‘perception’ (ibid). The designer can accomplish the difficult tasks of relating the object to its purpose, the object to the user, and to the environment in which the object is being used. A designer is the synthesizer and imposes order (Brown, 2009, p. 69). Brown (ibid) states that,

> *“Designers carry out research in many ways: collecting ethnographic data, conducting interviews; reviewing patents, manufacturing processes, vendors, subcontractors. They can be found jotting notes, taking pictures, shooting videos, recording conversation […] fact collecting and data gathering lead to accumulation of information”.*

This means that a design thinker synthesises[32] these information's into a whole (1988, p. 205). Bernstein (1988, p. 12-14) believes that many companies fail to understand that,

> *"Design is an interface; an explainer, the link between the thing and the user, between the company and the customer."*

Imagination, creativity, and lateral thinking and the ability to visualize are the skills that make a designer difficult to fit into a conventional working structure (Brown, 2009, p. 70). Bernstein (1988, p. 207) claimed, that the skill of synthesising gives designers an ability to organise different multidisciplinary factors and influences into a whole. Agreeably, Brown (2009, p. 172-174) explains that, designer's are interested in 'order' and this could get them inline with the organisational management. It's certainly true that a designer has to acquire certain business like skills and attributes, ergonomics, marketing techniques, retail pricing and consumer knowledge to take full control of a high profile role in a corporation (Christiaans, 2002, p. 41-54). Also, a designer's role must evolve to that of social scientists.

Often designers are called in too late in a company and can only pitch in their expertise as stylists (Osmon, 1988). For design to have the biggest impact as a discipline within business, it needs to be involved at the beginning of the product development process. This infers that the practice of transferring products for final styling to a design team must be made redundant. Blaich (1988, p. 29), then director of Philips Design, argued that,

> *"Design must be provided with greater influence in management as it has been recognized that design has great influence on industrial competitiveness."*

[32] Synthesis – A term stated by Brown, T. (2009) *Change by design,* New York, Harper Collins Publishers. Represents the ability of designers to combine complex and various sources of information into a single body of knowledge.

Current theory highlights design influence in predominantly three areas. First, design and its value of providing identity through products and services. Second is the role design plays in creation of knowledge economies by expanding the value of implicit and explicit knowledge as the most important asset for organisations. Lastly, designs role in supporting strategies for innovation by generating ideas in form of products and services. These theories reflect on the way design uses its capabilities and converts it into providing value in the following areas.

2.1.3a Design As a Tool For Corporate Identity

> *In brand-driven design strategies, design's objective is to create solutions, interactions and experiences that stem from the brand's vision and that make tangible and meaningful what the brand promises in abstract form. - Erik Roscam-Abbing*

All designs tell a story. It can be in the form of text, image, symbol, or hidden behind clever, layered communications conveyed through gestures, style, and metaphor or branding. Press and Cooper (2003, p. 45) state that,

> *"The relationship between design and corporate identity lies in the role the designer takes in creating the symbols and images with which groups are represented".*

Products too, tell more than what is immediately apparent. Products are the face of an organisation, a statement that a company makes about its image. Hence, the skills of a designer[33] are essential to the definition and solution of the problem and

[33] Designer – According to Blaich, industrial designers provide definition and solution of the problem and products to meet customer needs. The current study generalizes the skill for all designers as today we have evidence of this activity present in all specialties of design and not just industrial design. See: Blaich, R. (1987) Ergo design as a corporate strategy. *Behaviour & Information Technology,* 6**,** 219-227.

products that meet customer needs (Blaich, 1987, p. 220-222). Olin's (1988, p. 55) describes three important criteria through which identity emerges in business organisations:

- Products or services, i.e. what you make or sell,
- Environment; i.e. where you make or sell it,
- Communications, i.e. how you present what you do, and how you do it.

The key to work out all these identities is through 'coordinated design[34]'.

Kapferer (2004) & Olins (1978) discussed the gap between the company's identity[35] and image[36], and they claimed that New Product Development (NPD) could be used to bridge this gap. This embedded the use of design in branding further in conveying identity to consumers by its 'products, people, places and communication' (Abbing and Gessel, 2008, p. 10). Olins (1988, p. 56) took a more traditionalist approach and stated that,

> *"A product is a message, environments and literature affect the issue peripherally but it is primarily the product that dominates and conveys the identity idea."*

Olins (ibid p. 57-58) explains his argument by providing examples of product-based companies, like an automotive company, the product, i.e. the car, is the only way its identity is formed for its customers. It is primarily the way the car looks,

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[34] Coordinated design – A term referring to design inclusion at all levels of branding. See: Olins, W. (1988) Identity - the corporation's hidden resource. *In:* Gorb, P. (ed.) *London business school: Design talks!* London: The Design Council.

[35] Brand identity – It is referred to the essence of the brand that comes when the internal and external environment of the organisation are in perfect harmony with the different functions of the organisation, especially marketing and innovation. See: Abbing, E. R. (2010) *Brand-driven innovation: Strategies for development and design,* CH, Ava Publishing.

[36] Brand Image – It is referred to the face value of the brand towards its customers through its visual tools like logo etc. See: Lury, C. (2004) *Brands: The logos of global economy,* Abingdon, Routledge.

how the door opens, how big it is, what kind of engine it has, how it performs, what it costs etc. that makes people feel about it the way they do. He further elaborates his point by stating that when identity is being judged of a hotel, restaurant, beauty parlour etc; the responsibility lies on the shoulders of its architects, space planner, and the interior designer. In the case of retail, it's the shopping experience that establishes the identity of the company and it is exhibited through store setup design, interior fixture and gondola design and visual merchandisers who make sure customers return to their homes with a smile on their face. All his arguments identify only the basic specialities of design being used in the building of image of an organisation.

The role of design in creating image and corporate identity in terms of visual image, branding, aesthetic and impacts is important and visible all around us in the form of advertisements, brochures and communications of all kinds (Lorenz, 1988, p. 31). Marcus (2002, p. 10-12) believed that the idea of branding is much more than simple image building. Abbing (2010, p. 21) consolidated the use of design in making brand identity by stating,

> *"…A brand may operate as a logo of the company. Or it may be seen as the corporate identity of which that logo is a part. To some, the brand is a collection of perception in the mind of the consumer to be influenced by shrewd advertising. To other, the brand may be seen as belonging exclusively to the domain of marketing…Or the brand's expression may be considered to be limited to the fields of graphic design, advertising and packaging design…Although for many people such views on how a brand may function may be perfectly acceptable, from a brand –driven innovation perspective they are not…This view responds to shifting paradigms of brand creation and brand management that are apparent in contemporary design management discourse."*

In the past brand has been linked to logo design. It is only recently that brand is being talked as a strategy more so a strategy that belongs to top-level management. Branding is seen to have a connecting feature that holds together the inside and outside world of organisations with their innovation and marketing functions. Abbing (ibid) believes that combining design and design management to the brands ability to connect leads to transformation of abstract ideas into reality. Abbing (ibid p. 43) states;

> *"... 'Design as process' hereby becomes a strategic activity: to design something is to essentially execute strategy. This understanding of design process also establishes 'design as a skill' as a strategic resource: design competency within a company is a valuable asset. So it makes good sense to treat design strategically".*

Branding includes all aspects of public image of a product or service, in form and function to its name and logo, its advertising and marketing, which a company has to exploit (Marcus, 2002, p. 10). Organisations aim to have an internal brand driven innovation strategy to accomplish a complete image and Abbing (ibid) suggests design should drive this strategy.

2.1.3b Design as a Facilitator for Knowledge Economy

> *In the knowledge economy, strategy must focus on expanding existing markets or creating new ones – not beating the competition. – W. Chan Kim & Renée Mauborgne, 1999.*

The world is moving towards knowledge economies. Kok (2004, p. 19) describes knowledge economy as,

> *"The knowledge society is a larger concept than just an increased commitment to R&D. It covers every aspect of the contemporary economy where*

knowledge is at the heart of value added – from high tech manufacturing and ICTs through knowledge intensive services to the overtly creative organisations such as media and architecture".

Design is linked to providing meaningful 'order' and 'value' not just in terms of material, aesthetics or commerce of a product but also the socio-cultural influence on the environment to generate robust knowledge economies. There are a number of definitions for design to explain this role that it encompasses. Papanek (Cited in Greenhalgh, 1993, p. 230), states;

"Design is the conscious effort to impose meaningful order".

In addition to the above, Lawrence (Cited in Cross, 2008) says that design is,

"Values made visible".

As a result, organisations are transforming themselves to be knowledge-based strategists. In knowledge-based organisations the key asset is 'knowledge'. According to Conklin (2001, p. 3),

"Knowledge is the key asset of the knowledge organisation. Organisation memory extends and amplifies this asset by capturing, organizing, disseminating, and reusing the knowledge created by its employees".

Design is seen core to an innovation process in a knowledge intensive organisation that forms a bridge between the consumer and their expectation and the company with proposals to satisfy those expectations. Hutton (2010) states;

> *"Knowledge-intensive organisations range from information and communication technologies to advertising and from universities and hospitals to building aero engines. Design too is a classic knowledge-based organisation".*

Kimbell (2001, p. 4) argues that design has the ability to work around tacit knowledge and turn them into valuable knowledge for the team, hence they are fit to be at the centre of building of knowledge economies along with technology. He states,

> *"Designers thrive on tacit knowledge; and the world of materials, tools, studios and workshops is packed with opportunities to explore and exploit designerly hunches…In the process of modelling and in the associated discussions…[they] transform tacit into explicit knowledge and they frequently end up knowing far more about the topic of their project…"*

Additionally Conklin (2001, p. 3), also saw the value of design in creating display systems to capture informal knowledge in organisations. Brinkley (2010, p. 8) included creativity and design beside science, technology and R&D for the development of an explicit knowledge economy. He stated,

> *"We have deliberately included creativity and design alongside science and technology because in a knowledge based economy the two are inseparable… Many organisations in the creative organisations have developed cutting edge innovation in the use of new technologies, while even the most "hard science" intensive firms bring a creativity and flair to their products and services that would be instantly recognised by "creatives"".*

With world moving towards knowledge economy even Governments recognise the importance of design in building a knowledge intensive society. Presently,

manufacturing organisations invests more in design than R&D. According to Design Council (Hutton, 2010), design is the biggest source of intangible assets in United Kingdome alone. Design to drive an economy; the innovation environment needs to have all the right components for the innovation ecosystem. Hutton (2010) stated,

> *"Firstly, design needs to be an integral part of the new innovation 2020 ecosystem… Secondly, design needs to underpin our efforts to drive an export-led recovery…Thirdly; Design will have a key role in helping deliver more for less… Fourthly, Knowing why knowledge-intensive activities such as design are located where they are and how that might be changed is vital if a more regionally balanced knowledge economy is to be achieved by 2020… Lastly, organisations need to think how design can help them adapt to the coming decade".*

2.1.3c Design as a Resource for Innovation:

> *Good design is about looking at everyday things with new eyes and working out how they can be made better. It is about challenging exciting technology. – James Dyson, Ford Magazine, summer 1999.*

Innovation has a particular meaning when it is used in a multinational organisation's corporate environment. Each organisation has an innovation approach and usually this is a very complex process with fluid identity. This fluidity does not make it changeable, but adaptable where innovation is not measurable (Jolly and Council 2003). The determinants of innovation are various, and depend on different companies and their choice of innovation approach. Innovation has seen a remarkable paradigm shift where corporate culture is concerned (Nussbaum, 2008).

In corporations like Philips innovation guides business direction, which is in line with their mission and strategy (Gardien, 2009). Whitley (2000, p. 854) states that innovation patterns vary considerably between market economies with different institutions, and that they coordinate economic activities in different ways with different kinds of firms to develop contrasting innovation strategies. Innovation is always under the influence of external sources and needs to keep changing in order to realize its complete potential. Product Development and Management Association (1976) provide evidence of three types of markets that organisations try to capture through their innovative products; incremental products, products that are new-to-the-firm and products that are new-to-the-world. The latter two coming under different kinds of innovation based on breakthrough ideas called radical innovation. Scholars like Nelson & Winter (1977) and Dell'era & Verganti (2011a) believe that incremental innovation takes place within the technological regime, whereas radical innovation happens outside the defined regime. Cooper & Edgett (2007, p. 6) point out that,

> *"The number of projects motivated by cost reduction, repositioning and incremental improvements has grown, while the percentage of major revisions, product-line additions, new to the firm and new-to-the-world project dropped".*

They further claim that organisations are putting more short term projects in pipeline with incremental changes rather than thinking of long term innovation benefits due to lack of resources, pressure of making profit, exceeding customer demands etc. The only hope for multinational organisations is to get innovation to drive businesses. Cooper & Edgett (2007) push need for new product development and role of a creative idea team to generate new ideas in form of products and services. Cooper & Edgett (ibid) state that for many top executives the most important game is innovation in new product and new market. They also agree that essence of new product development is to have a product management strategy that

aligns creative and idea generation team with corporate strategy. Cooper & Edgett (ibid p. 19) state that,

> *"The point is that to drive innovation, your idea system must tap into a broad array of potential sources both inside and outside the company…No longer can you rely on a few people or a few departments to be the only source of innovation ideas".*

Stamm (2008, p. 60) suggested that organisations should have a mix between incremental and radical innovation. She provides organisations a framework of innovation categories ((Figure 2.2) to identify the product mix for their innovation portfolio.

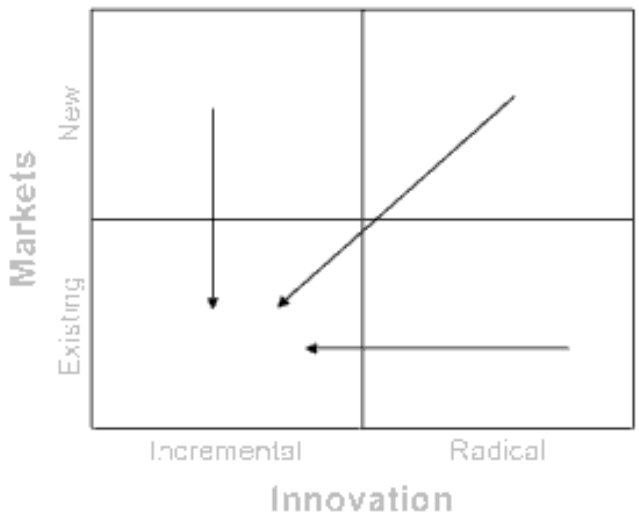

Figure 2.2: Innovation categories (Source: (Stamm, 2008, p. 61))

Stamm (ibid p. 61) claims that organisations today mostly focus on incremental innovation, thereby putting their future in jeopardy. She further states,

> *"Unless an organisation keeps putting new products into the far three quadrants, over time all its products or services will end up in the bottom left corner."*

Supporting the argument given by Stamm(ibid), Verganti (2009, p. 60) adds, that

> *"Organisations acknowledge that market competition is driven by product meanings. Radical innovation rarely comes from the consumer and cannot be facilitated by getting closer to the user".*

He believes that traditional market-pull innovation strategies that check customer acceptance before releasing a product to market could restrict radical innovation of meaning. Verganti (ibid) concludes by stating that,

> *"Organisations unable to make any breakthrough innovations are generally too busy chasing their users and they lose sight of the big picture".*

Leading the argument of the use of creativity and design in innovation processes Adair (2003, p. 43) points out that businesses go through a lot of internal turbulence due to the external environment and to build up models to manage sustainable developmental processes, in such situations two solutions have been identified to control the situation. Buganza & Verganti (2006) add that first is to reduce development time and second to increase the flexibility of the process. They claim that innovation being a continuous process requires organisations to manage the whole product and service innovation lifecycle by turning developmental process flexibility into life-cycle flexibility. Rightly stated by Press and Cooper (2009, p. 17),

> *"...Design and innovation are complementary, design being a core element of technical or product innovation yet also broader in its influence on product. Innovation is also broader than design in terms of management areas in which it can occur alone. Together design and innovation are in effect the drivers of any successful business".*

Brown (2009) along with his colleagues uses a tool called 'ways to grow' matrix (Figure 2.3). This tool helps the company (IDEO) map its innovation efforts along the vertical axis representing existing to new offerings and the horizontal axis representing existing to new users. In this diagram the most challenging type of innovation is when both the product and the user are new. This was achieved by Sony with the Walkman and by Apple with the iPod (Diller et al., 2008, p. 2).

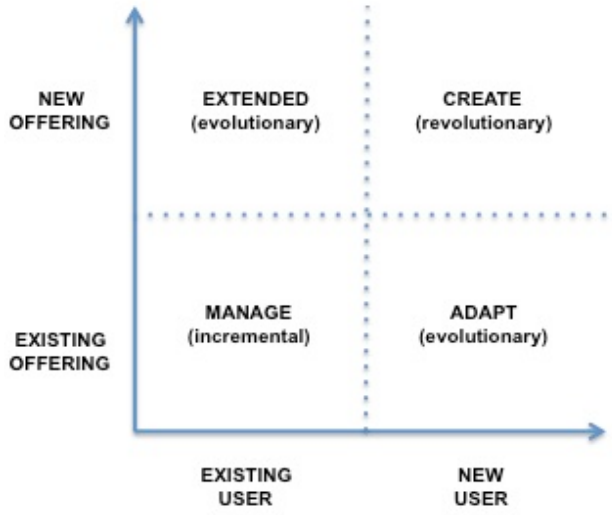

Figure 2.3: Ways to Grow (Source: (Brown, 2009))

Mumford et al. (2002) identifies that globalization, competitive pressure and demanding consumers have led to an increased burden on organisations, putting more premium on innovation making it difficult for the organisations to lead change. Supporting this argument Fenn (2011) states,

> *"Businesses see repetitive patterns of change, especially with technological innovations. These patterns are questioning the ability of capable companies, adopting highly advertised innovations, which often fail and do not understand why". In the hype cycle, the initial enthusiasm is built mainly on hope and hype. He further states that, "The biggest hype cycle lesson is that enterprises*

should not invest in technologies because the technologies are being hyped. Enterprises also should not ignore technologies just because the technologies currently are not living up to early over expectations".

To support his argument Fenn & Raskino (2008) also provide hype cycle that shows the social applications to specific technologies (Figure 2.4). These cycles can separate hype from reality and help strategic leaders to decide whether or not particular technology is ready for adoption. Linden & Fenn (2003, Cited in Ammann, 2005) believes that the beginning of hype cycle adds another dimension to technology life cycle models: it characterizes the typical progression of an emerging technology from the perceptions of the user and media over enthusiasm through a period of disillusionment to an eventual understanding of the technology's relevance and role in the market or domain.

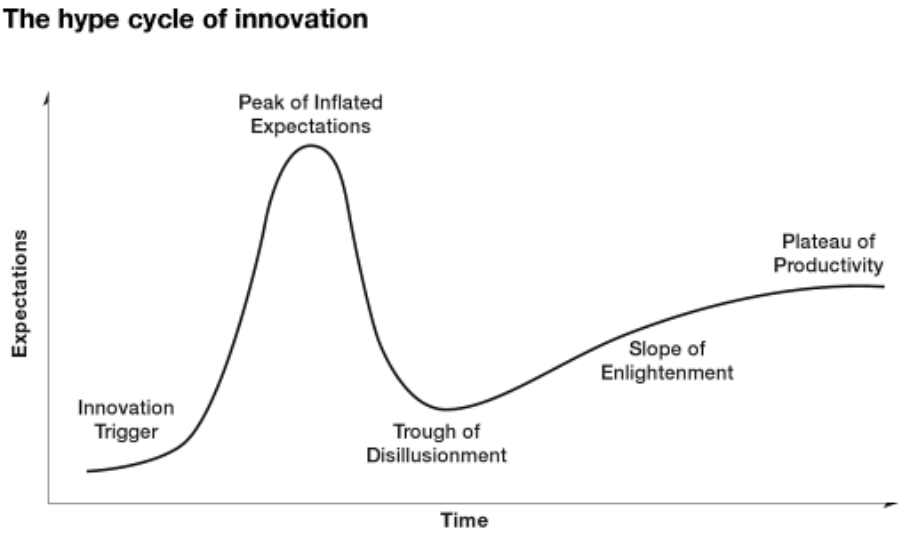

Figure 2.4: Beginning of a hype cycle (Source: (Linden and Fenn, 2003))

***Explanation**: As explained by Fenn & Raskino (2008) the y-axis represents expectations around an innovation and the x-axis shows time. An 'innovation trigger' starts the cycle when a breakthrough, product launch, or some other event generates press and organisation interest in some innovation. Companies that like to be ahead of the curve seek out the innovation and jump on it before their competitors. The supplier of the innovation boasts about their early prestigious customers and this bandwagon effect kicks in and the innovation is pushed to its limits as companies try it out for the range of settings commonly*

known as 'peak of inflated expectations'. The next phase of the curve is called 'trough of disillusionment' which is created when time passes and impatience for results replace the original excitement about potential value. A number of less favourable stories start to emerge as most companies realize things are not as easy as they first seemed. We see the slope rising called 'slope of enlightenment' which is owed to some early adopters overcoming the initial hurdles, beginning to experience benefits. Over time, the innovation itself matures as suppliers improve products on the basis of early feedback. Methodologies for applying it successfully are codified; the best practices for its use are socialized. 'Plateau of productivity' occurs with the real-world benefits of the innovation demonstrated and accepted; growing numbers of organisations feel comfortable with the now greatly reduced level of risk.

The hype cycle is driven by two factors: human nature, and the nature of innovation. According to Fenn and Raskino (ibid),

> *"Human nature drive's people heightened expectations; while the nature of innovation drives how quickly something new develops genuine value".*

These two factors can be described by two distinct curves (Figure 2.5). The first is a bell curve, which represents initial enthusiasm and disappointment driven by positive and negative hype (ibid). The second is an S curve showing how an innovation's performance improves slowly at first, then picks up steadily, and finally yields diminishing results (ibid).

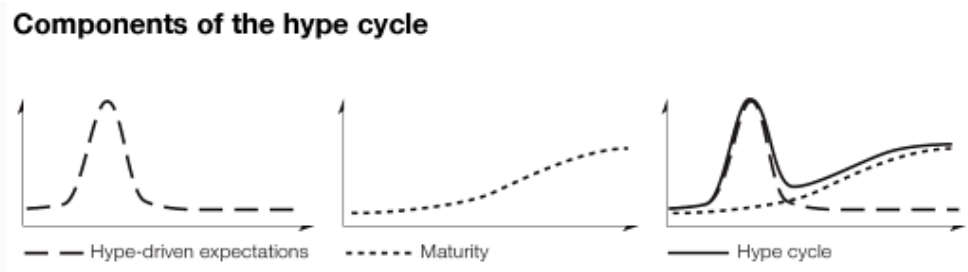

Figure 2.5: Components of hype cycle (Source: (Fenn and Raskino, 2008)).

Fenn & Raksino (ibid) add that usually there is more to innovation than hype, hope, and disappointment. Any innovation needs a considerable amount of experimentation and development, along with patience and tenacity, before it delivers anything worthwhile.

Above paragraphs have aligned the role of design as a functional leader at the strategic level of organisations. It highlighted how functional leadership supports the decisions made at strategic level keeping in mind the structure of the organisation. Kotter (1998, p. 41) believes that,

> *"Most organisations the central feature is interdependence. Interdependence occurs in situations where most employees are tied to many others by work, technology, management systems and a hierarchy and where no one has complete autonomy".*

Mintzberg et al. (1998) believed that these linkages pose a challenge when organisations attempt to change. The next section explains the phenomenon of interdependence through internal cultural change in organisations. It goes about highlighting how the changes in internal culture lead to learning environments and consequently affect the way design activities are carried out in the organisation.

2.2 Organisational Change

> *Whosoever desires constant success must change his conduct with the times. — Niccolo Machiavell, 1520.*

Much research has tried to explain why organisations change and how innovation sustains with the changing internal environment. Poole (2004, p. xii) puts change and innovation as partners and states that,

> *"[Change] is reflected in new products and production processes, advances in communications technology, and novel organisations and services in the public and non-profit sectors."*

Additionally, organisational change & innovation theorists alike Poole & Van de Ven (2004), Daft (1985), Handy (1985), Jick (1993) and Schein (1992) identify people, space and time as the most common denominators for transformation trigger.

Several schools of thought have provided theories on human versus organisation change and the complexity between them. Most traditional approach focuses on the individuals who are the agents change 'controlling, creating and remaking organisations' (Poole, 2004, p. 17). Others believe in the power of groups and work units or even organisation as agents working within the complex organisational environment. This concept makes action heterogeneous and detached from an individual. For example, Coleman's (1990) theory of social action and Pfeffer's (1994) theory of meaningfulness of agency over other than human individual promote heterogeneous influence over individual influence. Schön's (1983) theory of action research also elaborates on the concept of learning-organisations and focuses on organisations as a whole; nevertheless, he does not alienate the role of an individual.

There have been many sophisticated levels of research on the aspect of change and innovation in organisations. Bringing the focus on the concept of 'space' as a component of change and innovation. By 'space' I mean the relationship that happens between multilevel structures of organisations.

Dansereau et al. (1999, p. 345, 346) provides three basic forms of group and relationship in regards to multilevel phenomenon of organisation and change; first

a homogenous group with all members merged into a single higher-level unit and acting 'as one'; second a heterogeneous group which is composed of members that are interdependent, but not merged into a single unit; third a group of independent units having action of their own with no connection to any group as a whole. Dansereau et al. (ibid) further state that cross-level change happens when one form of group is transformed and shifts its role as another. In these cases the change occur in the relationship between the units as a whole and also between the individuals of other units. State changes can also occur if individual member is changed but the level of the organisation and individual remain the same. Additionally, space changes are also influenced by the change in time and level of the interaction. In such instances changes are analysed and mapped at the same level while time moves forward.

All these types of changes can happen simultaneously and pose a challenge for researchers. The complexity is highlighted further with the role of time in change and innovation. Poole & Van de Ven (2004, p. 21) state,

"Time is the 'ether' of change'".

Time is an overpowering subject. We are far from understanding the nature of time in innovation and change completely, but there has been researchers like Goodman et al. (2001), McGrath and Kelly (1986), Bluedorn & Dengardt (1988) who have stated several perspective of time in relation to organisational change. An example stated by Van de Ven & Poole (2005, p. 22) explains that the Newtonian time which assumes time to be linear and continuous with divisional units that are equal to each other; transactional time (Mcgrath and Kelly, 1986, p. 33), which is divisible but differentiated, with certain points serving as 'critical values' like birth, death, cell division etc. ; dominant culture time regards time as unidirectional and not bidirectional. Finally, organisational time is a combination of Newtonian time and transactional time. As stated by Poole (2004, p. 22),

> *"Time is unidirectional but also developmental, in that people work to accomplish task that take time to unfold and develop as they are carried out… people and organisations orient themselves to common externally defined time scales such as calendars, but also experience critical and significant events that interact with the objective temporal scale."*

Rousseau (1995, p. 151) provided three ways that organisations can manage change. They are;

> *"Drift, accommodate or engage in a radical transformation."*

Drift as a transformation is like a boat in floating water, balancing the changes internally while the external environment is turbulent. Accommodate strategy works by fixing a local problem, which necessarily does not effect the whole organisation. Radical transformation does not merely balances a local problem but questions the cause of the problem; it involves a change in fundamental assumptions, beliefs, and values of the people. According to Rousseau (1995, p. 151) fundamental assumptions are,

> *"The often unconscious beliefs that members share about their organisation and its relationship to them."*

Junginger and Sangiorgi (2009, p. 4339) add that these assumptions have a stabilising effect and form the 'core' of an organisation's culture.

It would be right to say that the concepts of people, space and time are not aligned well in organisational change theories. It has been challenging to show evidence of connection between these fundamental terms. Buchanan (1995), Dewey (1938) and

Junginger (2006, 2008) identify design and service design as a form of inquiry that could led and implement change within the organisation as well. Junginger (ibid) strongly believes that design, more so service design with its human centered approach in product development could transform its inquiry into the field of organisational change.

The topic of organisational change is incomplete without the study of the people and the culture of the organisation. The section below highlights how cultures in organisation are constructed and how it influences the learning process of the organisation.

2.2.1 Organisation Culture

The word culture has historical relevance. Ordinary people have used it to indicate sophistication, anthropologists use it to indicate the customs and rituals that societies develop, and in the last decade or so it has been used by organisational researchers and managers to indicate the practices the organisation indulges in (Schein, 1992, p. 1-3). As Watson (2001, p. 21) explains it,

> *"Cultures are 'human-made' and we are constantly remaking them as we go about leading our lives".*

Schein (1992, p. 1) adds to it by stating that,

> *"Culture is a phenomenon that surrounds us all the time and is constantly created and enacted by the interactions with others".*

Schein (1992, p. 2) believes that in organisation, cultures can be easily formed, created, managed, and manipulated. These dynamic cultural changes are one of the motives of effective leadership. He states,

"If leaders are to fulfil these challenges, they must first understand the dynamics of culture."

Contradicting Schein's (ibid) philosophy, Deal and Kennedy (1982) claim that strong top-level leadership does not play a key role to instilling a strong corporate culture. They argue that leadership might be important to build a strong cohesive culture but it is not necessary for leadership to provide extraordinary cultural identity to an organisation. Supporting Deal and Kennedy (ibid), Anthony (1994, p. 23, 24) adds that cultures form as a consequence of any change in the organisation. In order to survive external competition and influences greater cooperation and increased exercise of responsibility is required between workers.

There are many typologies of organisational culture. Members share these values and beliefs and transfer them to newcomers by established means. The earliest categorization suggested four main types of organisational culture; 'power, role, task, and person' provided by Harrison which was reworked by Handy (cited in Brown, 1998, p. 68-71) to describe the four cultures using pictograms by referencing them to Greek philosophies (Figure 2.6).

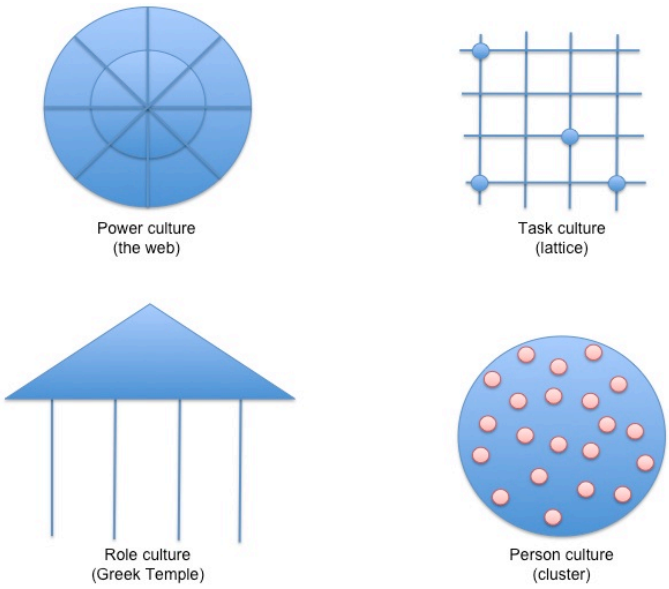

Figure 2.6: Handy's four organisational cultures. (Adapted from: (Cited in Handy, 1985))

Other important cultural typologies have been provided by Deal and Kennedy (ibid) based on the degree of risk associated with a company's activities and the speed at which a company receives feedback; Quinn and McGrath (Cited in Deal and Kennedy, 1982) identified four other typographies of culture based on the transaction associated with information exchange in the organisation. Whilst all the above typographies provide a good framework on organisational culture, it is difficult to fit them in the modern environment.

Rightly pointed out by Green (Cited in Nunnally, 2010) in today's environment the society is moving from pyramids to pancakes, where,

> *"This is a period of unprecedented change and transformation and while it is scary it is also a golden opportunity to re-address the kind of society we wish to live in".*

Contrary to the cultures stated by Handy, Quinn and McGrath, Scholz etc, Green (Cited in Nunnally, 2010) in her theory of Pyramids to Pancakes states,

> *"... Old* Pyramid *society of top down command and control through large organisations and based on economies of scale or is it a more* Pancake *society based on customized and contextualized solutions, enabled by the new technologies, and sustained by all the stakeholders involved in those solutions on a continuous basis".*

She goes on to explain that for this transformational age, the leaders are to have a lot of 'courage', to maximise a vision and mission statement that makes sense to the society and not just the stakeholders and financial elites and enable the agents of change.

The biggest myth about corporate culture is the notion that it can be influenced, changed, and managed. Cultures change only when they need to. Cultures change when their collective understanding recognizes the need for adaptation to the changing world in order for their business to survive. Emphasising the role of corporations is an example of organisation feeling like the need to adapt to the changing world where design is increasingly important. Design provides aesthetic balance in organisations and fulfils a supportive role. In recent years this role has been challenged and design has had to build its competency to hold a higher positions in organisations. Today, design is a recognized function in a few companies, which again requires cultural changes for acceptance by other functions.

Another important consequence of cultural change is seen on organisational learning. New cultures develop groups with new connections of learning. These connections enable the teams within the organisation to adapt to the concurrent change. The realities of organisational learning through new cultures are highlighted below.

2.2.1a Organisation Learning Through New Cultures

We must not forget that 'organisational learning' is a significant element of organisational change and developmental literature. Organisational learning depends on individual and collective goals of the groups involved. This highlights the relationship between learning and organisational culture.

Levitt and March (1988) states that organisations learn in two ways; first, by their own experience, and second, by the experience of other organisations. Both types of learning depend on positive and negative feedback. People learn faster from feedback they receive about their own actions, procedures, behaviour etc. According to Janis (1982, p. 9),

"Effective organisational culture develops due to complex interactive learning processes."

Another important source of organisational learning is the concept of "groupthinks" coined by Janis (ibid p. 175), which referred to,

"A deterioration of mental efficiency, reality testing, and moral judgement that results from in-group pressures".

Janis (ibid) believe that groupthink is not a positive aspect rather it is a threat to organisational culture as it develops out from the need of individuals for self esteem. It implies a greater threat to members with strong feelings of vulnerability and discontent.

Another important trigger for creation of different cultures in organisations is the theory of innovation diffusion by Rogers (2011). Innovations Diffusion theory explains how, why, and at what rate new ideas and technology spread through cultures (Rogers, 2011, p. 37-168). Rogers (2003, p. 5) claims that,

"Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system. The origins of the diffusion of innovations theory are varied and span multiple disciplines."

Roger's shows this by using an adoption curve (Figure 2.7), the x-axis is time and y-axis is number of people. This diffusion curve is useful in new business change as well as marketing. Mahler & Rogers (1999) claim that on implementation of a new system, this model is used to role out the change method for each group separately .

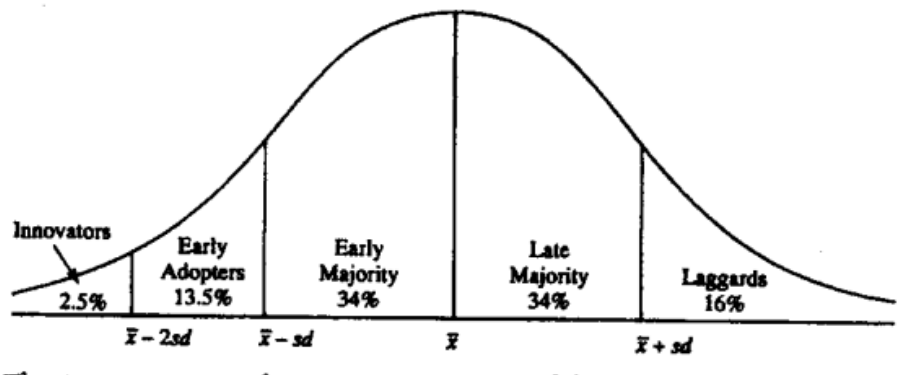

Figure 2.7: The Diffusion Process and Adopters Categorization on the Basis of Innovativeness (Source: (Rogers, 2011))

Explanation: *As explained by Rogers (ibid p. 13) this curve is divided into five sections namely innovators, early adopters, early majority, late majority and laggards, all representing market segments/groups of people. These adopter categories are classifications of the members of a social system, classified on the basis of innovativeness and the speed with which an individual or a unit of adoption is adopted as a new idea compared to other members of a system.*

The diffusion process generally begins with the first adopter of an innovation, that is, with the left-hand tail of the S-shaped diffusion curve. The next step of innovation-development involves all decisions, activities and their impacts on the recognition of a need or a problem, through research, development and commercialization. The final way in which a social system influences diffusion concerns consequences, the changes that occur to an individual or a social system as a result of the adoption or rejection of an innovation.

Mahler and Rogers (1999, p. 719-740) confirmed that S-dynamics could be produced without assuming that the people are different. Their study confirmed that cultural transmission and bias dominates the innovation diffusion process. They further explain that the categorization of innovation adopters also influences the way organisations function internally and the effect it has on the people involved in working on the new innovation research. Rogers (2011, p. 279) claims that the categories of adopters differ in personality, education and communication behaviour and are used for audience segmentation. They are created due to leadership, communication networks, interactivity, change agents, the organisation, definition, structuring, reutilization, and finally consequences (ibid p. 27).

According to Rogers (2011) each of these groups, think differently and needs different marketing and sales approaches.

Verganti and Dell'Era (2011a, p. 894) identify factors that impact 'diffusion dynamics' in design intensive organisations (in Italy). Their empirical results highlight speed and contagion as the most important dynamics for transformation of the meaning of the products. Verganti and Dell'Era (ibid) confirm that,

> *"Collaboration supports both dynamics, and the meaning of a product is quickly perceived and followed by the rest of the market if focalization is enabled (product meaning is proposed by several companies with precise identities), the new product meanings have the ability to influence the market if companies with high reputations participate in the diffusion".*

In order to enable internal integration of groups and their categories and subcategories, the leader needs to devise a common language and establish a system of communication that permits explanation and interpretation of everything going on around them. To provide security to the new members entering an old group, the group must have its assumptions explicitly defined or at least fixed. Schein (1992) explains that each group separately has to decide simultaneously on how to deal with division of power and also enhance relationship with their peers. Hence, making management of these groups an important part of the discussion.

2.2.1b Management of Cultural Aspects in Organisations

Other than the mobilization of people working in organisations, another method of changing culture in a corporation is through human resource management. The real importance of human resource management (HRM) is in the transmission of culture to newcomers (Stern, 1993, p. b14). The reach of an organisation's human capital is beyond imagination.

In order to manage human capital in an organisations it's important to understand how human relationships form. The individual, through their exchange and conflict with other individuals, have shaped industrial capitalist societies and given rise to organisations and managers. On the other hand, societal discussions gave rise to the social and technical division of work, which now takes the form of the employer-employee relationships. Watson (2006, p. 114) claims that the central bureaucratic principle forms the foundation of organisations and managers. If we take into account the exchange happening between workers Watson (2006) believes that,

> *"When an exchange between employers and employee happens most of it is a relational matter, with certain elements of this exchange formally agreed and very little written down in a form of a contract."*

Watson (ibid) believes that this exchange has a shared belief that if employees work to the best of their abilities the company they work for will provide positive work conditions, enough pay and a stable career. Unfortunately, due to the current conditions this belief has been compromised. Weick (1995) provided evidence of compromised employee and organisation relationship through display of anger by employees in form of strikes, sabotage and union militancy; also applicable in 21st century events as well. Fisher (2003) adds his theory of 'change curve' (Figure 2.8) and states that,

> *"Once the anger subsides, depression sets in and leads to grudging acceptance of the condition."*

Fisher (ibid) adds that only when the new reality becomes widely accepted can business reclaim the sense of unity they once enjoyed.

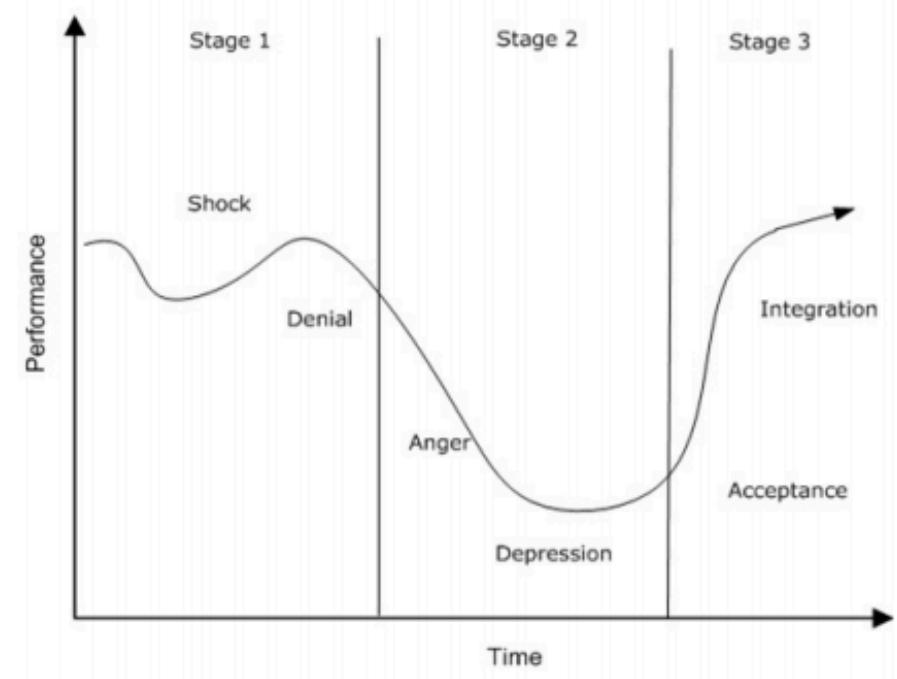

Figure 2.8: The change curve (ibid)

Explanation: *As explained in (Fisher, 2003) the change curve model describes the four stages most people go through as they adjust to change. Their first reaction on being introduced to change is of shock or denial. This is a normal reaction to the challenge of status quo. Once reality of the change starts to hit people react more negatively by showing anger and resistance and finally leading to depression. For as long people remain in the angry stage any change will be unsuccessful. The above stages are described to be unhealthy, stressful and unsuccessful. For everyone, it is much healthier to move to the next stage of the curve where people stop focusing on what they have lost. They start to accept changes and begin to test and explore and learn the new realities. Finally the change curve leads to a stage of people embracing change. Only when people reach this stage can an organisation start to reap benefits of any change.*

Deal and Kennedy (1982) debate by stating that business unity comes with a price and this price is of denial, disbelief, fear, cynicism and distrust. When involved in management of people, it is inevitable to be involved in exercising 'power' and also be a subject of it. In organisations people have goals, priorities and ambitions of their own, and they will all be competing with internal teams and functions or sections of organisations for assets, budgets and the resources required to accomplish their goals and satisfy personal or group wants. This gives rise to *micro*

politics[37]. Anthony (1994, p. 23) adds that a high degree of ambiguity, uncertainty, the strategic needs of individuals and the way organisations are set up into sub-units makes micro politics inevitable.

The use of power in changing corporate culture is eminent in a number of organisations. Handy (1978) describes the internal organisational structure, or power culture, to be governed by empathy, trust and communication, with little need for bureaucratic procedures, where control is exercised from the centre through key personnel by edict. Yulk (Cited in Dubrin, 2010, p. 8) argues that organisations are complex social systems of patterned interactions among people. He further claims that one strong and prevalent explanation of organisational events is to attribute causality to the influence of individual leaders (Calder, 1977) who are exaggerated as heroic figures (Yukl, 1998). Kotter (1998, p. 41) states that,

> *"The day-to-day behaviour of the leader can be observed by subordinates, peers, and superiors, and the leader's actions have immediate consequences for the performance of the team or group".*

Another important aspect related to cultural change and adaptation is the inclusion of creativity and design in organisations. Scholars alike Bernstein (1988), Lorenz (1988), Mozota (2003) and Brown (2009) have stressed on the importance of creativity in innovation. These theories have led to one big question, which is, how should one attempt to lead creative efforts? Mumford et al. (2002) believe that the answer to this question has been not to lead, but to get out of the way and let the 'creative' people do their work. Contradicting Mumford et al.'s (ibid) claim, Christiaans (2002, p. 53) identifies that leadership is important to creative people in order to carry out innovative efforts.

[37] Micro Politics – Term that describes the use of informal power by groups within an organisation to achieve their goals. See: Handy, C. B. (1978) *The gods of management,* Harmondsworth, Penguin.

As businesses begin to extend the image and use of design in their innovative process, there is a need for design thinkers to step up their game and develop knowledge and capabilities to meet up the expectation and smooth integration within the organisational strategy. Cautela and Zurlo (2011) came up with three priorities needed for design managers to step up their game; they were,

- Quality over quantity: creativity is not in short supply, and that the key question is how to deliver high-quality design.
- Analytical and intuitive thinking: the design profession must aspire to balance between analytical and intuitive thinking.
- Vision over user insight: The biggest challenge for design managers is to put vision back into the talent of designers, which they have lost trying to follow users and turning themselves into businessmen away from their visionary's character.

2.2.2 Linking Organisation and Design Thinking

> *What now matters is the design and delivery of value. That needs design thinking. That needs creative thinking. Judgment thinking alone is not going to be enough. Most people, in business and elsewhere, have done very well on judgment thinking. Such people are rarely aware of the need for 'design thinking'. They find it difficult to conceive that there is a whole other aspect of thinking that is different from judgment thinking. It is not that such people are complacent. It is simply that they do not know that there is another aspect to thinking. - Edward de Bono, 2003*

Postmodernism has changed the face of organisations, in the way they do business, their day-to-day activities and the way they structure their functions as well.

Postmodern practices has turned organisations into a domain where all experiences are shared, performances are judged in real time and creativity is cherished at all levels. Postmodernism has seen the evolution of cultural studies, individual behaviour and has reshaped management and organisation literature; consequently leading to social constructivism as a movement that influenced the fields of cultural studies including design. The concept of 'habitualised' action in construction of social reality by Berger & Luckmann (1966, p. 55-61) provides evidence for evolution of individuals towards creative, imaginative, and innovative platforms. They state,

> *"Habitualised actions, retain their meaningful character for the individual although the meanings involved become embedded as routines in his general stock of knowledge, taken for granted by him and at hand for his projects into the future...appearance of a stable background in which individual may function with reduced amount of decisions to make would liberate energy and open up a platform for imagination, innovation and [design thinking] to burgeon."*

It is this platform that has paved way to inclusion of design and creative capabilities in organisations today. Design is deeply engraved in postmodern organisation systems. The fundamental elements of change 'people, space and time' stated by Poole (2004) happen within these organisational systems consequently affecting each other. Junginger & Sangiorgi (2009, p. 4339) explain this relationship by stating that,

> *"This organisational system we are referring to concerns the core elements of the organisation at hand: its people with their norms, values, beliefs and behavioural patterns; its structures, which includes procedures, hierarchies and tasks; its resources and an organisation's vision, which gives purpose and guidance for how resources might or might not be used."*

They argue that design and services are not alien to these structures. Hence any change within the organisation affects design as well or is a consequence of it. A variety of research covered in; journals, conferences, articles, and practical work in design led corporations, continue to expand the meanings and connections and reveals unexpected dimensions in the practice and understanding of design. Cautela & Zurlo (2011a) stress on the use of design management as a steering wheel as well as a driver of innovation in multinational companies. Dell'Era & Verganti (2008) provide managers with new tools including the theory of innovation diffusion to be applied into giving new meanings to products. Additionally, Rae (2008) describes how design thinking and co-creation had a positive impact on the work culture of Procter & Gamble. In addition, one of the trends, started due to the extensive work on design and its connectivity with other disciplines and methods used by the organisations is the concept of design thinking (Brown, 2009, p. 16).

Design thinking is explained in different ways by different thinkers, scholars and practitioners. According to Brown (ibid.),

> *"Design thinking process is invariably an exploratory process. The mere act of designers being involved in iterative and non-linear nature of the creative journey at times integrates into the on-going process without disruption and at other times the mere discovery motivates the team to rethink their earlier stance."*

Brown (2009, p. 18) differentiates the way designers and design thinkers associate with these constraints. Brown (ibid.), claims, that a designer would attempt to solve each of these separately but a 'design thinker' would bring them into "*a harmonious balance*". The important aspect that differentiates business managers and design managers is their way of thinking. Generally a business being analysed by economists will be guided by graphs and excel sheets. However, a business

involving design as one of the specialist will be influenced by (architecture/design/anthropology) an approach commonly called A/D/A (Aminoff et al., 2010). Rightly put by Lafley (Cited in Rae, 2008)(CEO of Proctor and Gamble),

> *"Business schools tend to focus on inductive thinking (based on directly observed facts) and deductive thinking (logic and analysis, typically based on past evidence)". Whereas "design schools emphasize abductive thinking – imagining what could be possible. This new thinking approach helps us challenge assumed constraints and add to ideas, versus discouraging them."*

Brown (2009) supports the theory that design thinking is the core to creative activities in an organisation. In support of Maccoby's (1991) theory which explains that design gives shape to the problem definition and also helps in discovery of new, user-oriented solutions rather than focusing on the improvement of existing solutions; Brown (2009) states that creative thinking has a lot of benefits over business thinking. Most importantly, it removes the fear of taking risk (Aminoff et al., 2010). Additionally according to Maccoby (1991, p. 35),

> *"Design thinking helps in providing solutions to problems, new value addition/creation to all future ventures and new vision to stimulate the future."*

With the on-going research and interest in the field of design we can confirm that design is not just about giving shape and aesthetic form to objects, but it has evolved into solving real world problems (Schön, 2003). To understand the role of design it is important to highlight where design comes from and 'who' are these creative people and 'how' do they incorporate the activity of finding solutions to problems or defining new business, into the way of working for the organisation.

2.2.2a 'Who' are Design Thinkers in Organisations

Innovation requires happy warriors. According to Sutton (2007, p. 2) i.e.,

> *"Upbeat people who know the right way to fight."*

Arguments are crucial to creativity, but people need to learn how and when to fight. Mumford et al. (1991, p. 91-122) agree that in the very earliest stages of idea generation, conflict and debate could cause more damage by causing rejections to ideas before they are developed well enough to be evaluated. Later, Mumford et al. (2011) claimed that creative work provides autonomous power to an individual intensely working on a demanding problem. On the other hand Mumford et al. (2002, p. 729) also pointed out that organisations see creative work as disruptive to organisational routines, leading to changes in production processes, shifts in strategy, etc. Abra (1994) believes that collaboration with creative people lead to a tense environment between the relationship of its organisation and creative processes.

Creative people seem to pursue multiple problems in their own network of collaborators. They draw their identity from the network and not just the organisation. As Mumford et al. (2011, p. 405-417) claim that due to its complexity, creative work often proceeds in a social context and is based on coactive[38] relationships. Schmitt et al. (1995, p. 83) agreeably adds,

> *"Most creative activities take place in teams."*

[38] Coactive – Mumford et al. explains coactive as collegial relationship where individual coexist and responsibility is shared between each individual within the working network. See: Mumford, M. D., Robledo, I. C. & Hester, K. S. (2011) Creativity, innovation, and leadership: Models and findings. *In:* Bryman, A., Collinson, D., Grint, K., Jackson, B. & Uhl-Bien, M. (eds.) *The sage handbook of leadership.* London: SAGE.

It is possible to operate as an individual but the complexity of today's issues is making this very difficult for inventors. The concept of a designer working in a garage and making sense of form and function has been transformed into multidisciplinary teams where we see designers working with physiologists, engineers, scientists etc. Yukl (1998, p. 421-424) states that,

> *"The positive synergy that occurs in effective teams can help them achieve a level of performance that exceeds the sum of the individual performances of its members."*

Yukl (1998, p. 422) explains that cross-functional teams are being used increasingly in organisations to improve coordination of interdependent activities among specialized sub-units. He adds, that these cross-functional teams usually include representatives from each of the functional sub-units involved in an activity or project. It may also include representatives from outside, such as suppliers, clients and joint venture partners. Yukl (ibid p. 422) states that,

> *"Such a team has the responsibility for planning and conducting complex activities that requires considerable coordination, cooperation and joint problem solving amongst the parties."*

Stern (1993, p. B14) talks about the problems related to cross-functional[39] teams and states that,

> *"The same conditions that create potential advantages for cross-functional groups also create difficulties, the functional diversity of the members*

[39] Cross Functional – They are basically a group of individuals coming from different functions of an organisation working together. These teams are seen to be less uni-directional and less goal dominated. See: Yukl, G. (1998) *Leadership in organisations,* New Jersey, Prentice Hall.

increases communication barriers as each function has its own jargon and ways of thinking about things."

Additionally, Sutton (2007, p. 1) believes that the cross-functional teams have different objectives, time orientations and priorities. Involved team members have primary loyalty towards their functions; hence decision-making is more difficult and time consuming. Brown (2009, p. 22-25) on the other hand points out that multi-disciplinary[40] teams improve organisation decision-making process. He states,

"Coordination is improved and many problems are avoided when people from different disciplines come together to work at the same time rather than sequentially."

He explains, that the exploratory process leads the team to make unimaginable discoveries. Organisations have complex relationships with creative work, which may or may not be valued. However, it may be time consuming, costly and risky. It must be recognized that people engaged in solving real world problems through creativity have a distinct working style. Creative people expressively evaluate the significance of the problem and consider multiple implications of their solution.

Cross (2011) believes that there are a few basic differences between the thinking and ways of working of an Innovator[41] and other disciplines. Maccoby (Cited in Cross, 2011, p. 75) argued that innovators have a 'systems mind' that sees things in terms of how they relate to each other. In contrast engineers are concerned about designing a good piece-part. Many innovators especially, design innovators explore

[40] Multi-disciplinary – Knowledge associated with more than one academic discipline or profession working together on a project as equal shareholders. See: Brown, T. (2009) *Change by design,* New York, Harper Collins Publishers.

[41] Innovator – I have used the word innovator to describe an individual involved in creating new products, services, and ideas irrespective of the discipline he belongs too. In most cases, these individuals are self-motivated and might or might not work within an organisation. See: Maccoby, M. (1991) The innovative mind at work. *IEEE Spectrum***,** 23-35.

a problem from a particular perspective, in order to formulate or frame the problem that stimulates pre-structures and emergence of design concepts.

2.2.2b How do Design Thinkers Work

To design things is normal for human beings and it was not considered to need special abilities. Potter (2002) believes that the presence of design in our life has been evident in the artefacts of previous civilizations and in the traditions of traditional craftworks. Cross (2011) explains that even with so much design-taking place around us we have very little understanding of how the process of design is done. And what are the capabilities of a person involved in such activity.

Despite Cross's explanation, scholars and researchers like Potter (2002), through participatory observation, Davis & Talbot (2002) and Bucciarelli (1994) through ethnographical study, have tried to determine the way designers work. Schön (1983) and many more including Cross (2011) himself have conducted experiments to understand how designer's work and if they differ from other people working in other disciplines.

Potter (2002) further stated that designers are not able to explain the activities involved in making a product. When asked about the process of designing, designers talk about the outcomes and not the activities. Sometimes designers seem to be obscure about their process, the way they work and where ideas come from. Cross (2002) agreed with Potter (ibid) and added that the inability to explain the procedure is a prevailing feature in all fields, as experts like evaluating what they produce and not how they do it.

For example, Robinow (Cited in Maccoby, 1991, p. 24, 25), an engineer by background, was an ardent inventor with over 326 patents to his name. In his book, he talks about inventing for fun and profit and talks about the process behind his

inventions. He states that it is ego, the challenge, and the fun of solving the problem that drives people like him to invent new things. On describing the process he states that he has no doubt that invention is a random process. Robinow (ibid) states that,

> *"When one is looking for a solution – one figuratively puts all the information, all the things one knows, on cards and throws them up in the air. As the cards hit the floor one looks them over and sees if any of them together, in combination, makes sense. Does the combination come up with something that one hasn't yet though of – a new interesting combination? The individual items of the combination may also be quiet old".*

Once the new concept begins to develop, innovators want to try out resonating ideas with students and colleagues. They call it 'bounce ideas off people' or 'playing off ideas' without the expectation of earning an agreement or acceptance. Maccoby (1991, p. 27) believes that for innovators disagreement, negative instances or a failure to find confirmation of one's innovative hypothesis is a learning curve that provides stimulus for new ways of problem solving. Other disciplines consider a negative opinion as an emotional let-down or a disappointment.

Another interesting example of an innovator is James F. Blinn (Cited in Maccoby, 1991), a mathematician involved in graphic design for computer animation. His job enables him to work simultaneously as an artist, an academic, a scientist, and a mathematician. Among his successes are the voyager spacecraft flyby of Jupiter and Saturn, video simulation of DNA replication, animation for Carl Sagan's "Cosmos" television series, and many more. For Blinn (ibid) insights and ideas come at unexpected moments. When he tackles a design problem, he uses back and forth iteration. He first examines the details, then backs up and examines the holistic problem. Then again goes to examining the details.

A study that highlighted the ability of designer's to produce consequences other than those intended was provided by Schön (1983, p. 103) through the technique of a reflective practice. He argues that a designer is faced with a situation of 'complexity' and this complexity makes the designer to make moves that are sometimes unintended. The designer may take account of the unintended changes in the situation by forming new appreciations and understandings by making new moves. According to Schön (2011), designing proceeds as a,

> *"Reflective conversation with the situation, an interactive process based on framing a problem and exploring its implications in 'moves' that investigate the arising solution possibilities".*

Mead's career theme (cited in Maccoby, 1991, p. 26, 27) has been to blend basic science with developmental engineering. His creative process is a solidarity struggle until "reality intervenes." However, he still needs to be in regular contact with engineers and scientists. He talks to people for ideas, insights, and inspiration. Mead (cited in Watson, 2005, p. 23-25, Maccoby, 1991, p. 30) states that,

> *"Without the contact of rich intellectual space, I would have been barren". Further he adds, "he cannot invent things with zero and he needs to put together things that are from the milieu of people that he collects".*

If we look at the examples provided above we see a similarity that is the lack of use of an explicitly defined process. Whether it is Robinow, an ardent innovator, James F. Blinn, a mathematician, or Carver A. Mead, an engineer, they all understand that a creative process takes time and requires the help from a lot of external forces to be successful. Design process and creative thinking is not something that can be taught by text but has to be experienced and explored by the innovator, eager to find solutions to problems.

On the other hand Wasserman (1994) believes that organisations will only trust the use of design when they have details of the tangible benefits showing precisely how and where design is associated with the development of successful innovation and improved company performance. There is a lack of a clear theoretical framework as a starting point for analysis and application. Srinivasan et al. (1997, p. 597) point out that low utilisation of design in corporations has led to,

> *"Tensions between disciplines like design and marketing research, as they differ fundamentally in the level of trust that they place in rationalist, decomposition techniques and statistical survey instruments for product development".*

Trueman and Jobber (1998, p. 598, 599) contribute to the debate and state that the design dimension of the 'process' is possibly the least understood and least utilized tool in innovation practices. They observed design process to be not tangible, defined, clear, and easy to measure, and varying in every organisation. The process also involved managing highly confidential material on which top-level management decisions are required. They state,

> *"...The information is less accessible for research, as well as it being very difficult to translate the process into performance".*

Design-Driven organisations tend to activate strong and weak ties structuring a dual network characterized by two relational levels. Cautela & Zurlo (2011, p. 9) highlighted them by stating,

> *"The first forms a core of stable and trusting relations between company and designer; the second is composed of new and occasional relationships."*

Many scholars have identified design playing important roles in decision-making at the strategic level of organisations. There have been many instances where scholars have identified troubles in the culture of design that comes in its way of exercising sound design strategies. And many have tried to understand how design navigates through the structure of organisations and is able to add value to it despite having ambiguous processes. The current research has tried to highlight this issue by defining strategic level management and describing the role design could play at that level. The research has drawn upon the functional leadership theories and has tries to scope out the ways in which design has been established as one of the functions in organisation.

Design poses new challenges to organisation culture, establishing its own way of working leading to generation of new ways of communication. It goes about later in highlighting the cultural changes and the way organisations navigate through these changes. It further highlights the role of designers as language brokers, which assures better ability for organisation to manage its design portfolio in relation to its value propositions.

SUMMARY

In this chapter I have outlined the problem area of the research related to design being accepted as a leading functional discipline as the strategic level of an organisation. The chapter discusses the problem area by highlighting theories from different disciplines that are relevant to the practice of design in organisations. Design itself was seen to have very little literature defining itself in a leadership role.

I have described the issues in two sections; the first defines strategic management and how functional leadership theories are related to strategic decision-making. It goes about highlighting the current theories on the influence of design on these

decisions and evidence about the roles design plays at different levels of the organisation. The second defines organisational cultures, specifically talking about the influence of cultural change on individuals working within the organisation. This section then goes about explaining how design poses new cultural challenges to other disciplines by highlighting the way design activity is carried out by innovative people.

CHAPTER 3

EPISTEMOLOGICAL FRAMEWORKS AND RESEARCH METHODS

CHAPTER THREE: METHODOLOGY

The research started with a field study where I was required to be part of the research, development and innovation team (RD&I) at Philips Design based in Eindhoven. I was involved in an internal project with the RD&I team to define, refine and explicitly communicate the innovation process of Philips Design at the strategic level. Due to the involvement of Philips as an important third party, the research started with a field study and later involved myself being part of the process of sense-making and validating the conclusions. A valid epistemological and philosophical framework supported the PhD study. The philosophy, methodology, strategy and techniques, have been influenced by the research philosophies of constructivism (Glanville, 1997, Crotty, 1998).

The research did not begin with a clear philosophy, but as time passed I noticed my reflections clearly aligned with 'constructivist' philosophy. Therefore, the methods that I am using for my research are chiefly inspired and informed by the works of Schön (1983); reflective practice, Buzan and Buzan (1989); creative mapping techniques and Glanville (2005); radical constructivism. It would be inaccurate to infer that a clean and planned version of the process took place, when in reality the research went through a lot of uncertainty and challenges, which are the rationale for the choices of the final methodology and strategy. For a better understanding of the philosophical developments in the research, this chapter will give a detailed chronology of the research process in terms of the epistemological approaches adopted and the resulting methods utilised.

The chapter will first portray arguments highlighting past epistemological and ontological evidence in the field of design and management research. Next the chapter will introduce my initial stance and what was learned as the field study was being carried out. It will also explain how the methods were selected and I made sense of them, along with a glimpse of the challenges faced in adhering to those methods and processes in a practical working environment. The selection of

methods was based on the inductive and abductive approach described in the Introduction (Chapter 1). This was supported by the cycle of reflection to interpret the data collected and to make sense of it for the study (Eisenhardt, 1989). Furthermore, the chapter will display the epistemological reasoning of the researcher whilst outlining the final stages of the shaping of the process and methodology under the umbrella of action research.

The chapter then will go on to describe the specific methods that I selected for this research. It will give a detailed description of the advantages that each method provided, also the implications of making the selection. Detailed description of the research plan and design will be given followed by the overall visual mapping approach taken to make sense of the research data, as well as the thinking supporting it. It will highlight the implication of selecting a mixed method approach and describe the four phases of the reflective loop, by describing each phase separately.

3.1 Arguments

In the journey that I have taken in my PhD, I have come to the conclusion that there are no ideal methodological approaches for research. Selection is about the most appropriate methodology for the investigation of a given research question, as it depends on a large number of variables. Gill and Johnson (2010) state that the selection also depends on the research question itself and how the researcher constitutes or interprets that question.

The research question was: 'How could design be established as a functional leader in multinational organisations and help design drive innovation at the strategic level successfully?' and it raises an interesting epistemological debate that ranges from the discipline of design into the core of management studies. The field of design research here is based on the use of graphical representation techniques

generated from observational studies of the Philips Design Innovation process. These techniques explicitly define and visually communicate the complicated field study, which also helps in shaping the overall structure of the research. The epistemological intersection of management studies and design studies has enabled a sound rationalisation of the research and gives it a robust epistemological and ontological structure. This intersection can be seen in figure 3.1. In addition, combining the design discipline with a management research philosophy has challenged the post modernist philosophy of management research. To give the research a strong methodological backdrop I have tried to incorporate inputs from both disciplines, which are pointed out in the paragraphs to follow.

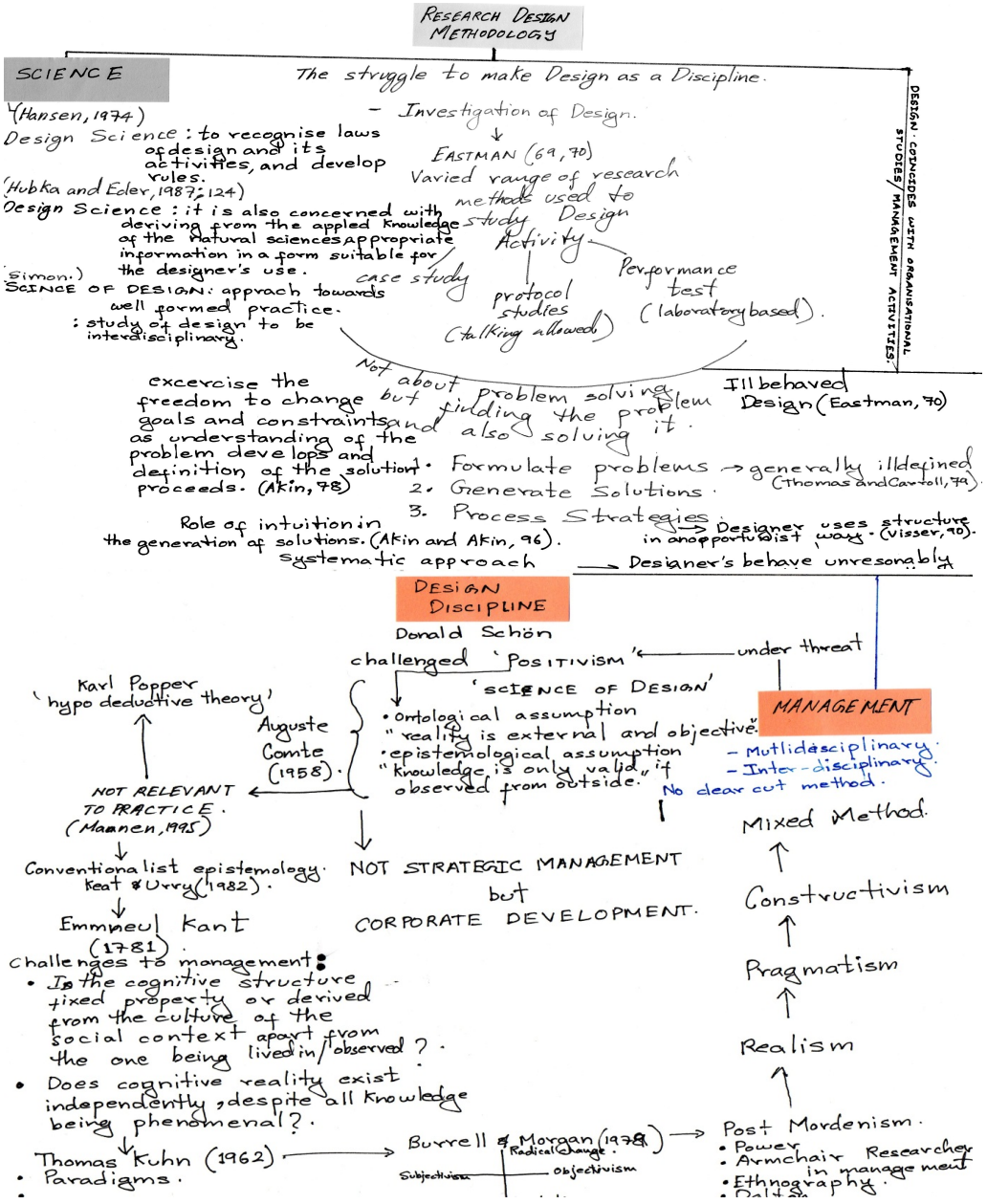

Figure 3.1: Mapping of epistemological link between Design Discipline and Management Studies.

3.1.1 Design Discourse

Design is an important characteristic of human nature. Design has been a core topic in the study of cognitive science, that is, the interdisciplinary study of the complex intellectual capabilities inherent in human beings (Visser, 2006). The design and science relationship has been discussed by philosophers like (Schön, 1983, Hubka, 1988, Cross, 2001) who have tried to define design in relation to science and other social sciences.

Design theorists have always struggled to establish design as a discipline. According to Cross (1999, p. 5-7),

> *"There has been an on-going discussion for the design discipline whether to be 'design science' or 'science of design'".*

In my opinion, the design discipline neither has to be compared to science and take any meaning out of science as a discipline, nor does it have to continue to be regarded as a mysterious study. Cross (1999) claims that design as a discipline, has its own identity and structure of epistemological studies, which gives it the potential to be an independent discipline.

Eastman (1969; 1970, cited in Cross, 2001) studied a range of research methods to understand design activity. The prominent methods that helped in the study of design activities were case study and performance tests based in a laboratory. Another method that was used was 'protocol studies', which documented the ways designers think by taking notes while they were allowed to talk out loud during work. Through these examples, Cross (1999) defined design activities to be not just about,

> *"Problem solving, but finding the problem and also solving it".*

This has led to the division of design as a discipline into three broad categories of activities, as follows;

- **Formulate Problems:** This area defines the way designers work and their attitudes. The research done by Eastman (1970, cited in Cross, 2001) on a group of senior students from engineering design backgrounds laid the foundation of designers being 'ill behaved' in their approach to formulate problem areas. Thomas and Carroll (1979) conducted a study where they deduced that the problems formulated by designers were generally 'ill-defined'. Akin (2008) believes that designers have been seen to exercise the freedom to alter goals and constraints. He believes this is done in order to understand the problem and later is useful in developing and defining of the solutions.

  Generate Solutions: The role of intuition plays a very important role in the activity of generating sound solutions for predefined problems (Akin and Akin, 2008).

  Process Strategies: Strategies and processes within design activities are what define the way an activity is carried out. Design today influences a lot of strategies and processes that are not currently related to design and are found in big corporations in a multidisciplinary environment. Processes need structure and designers, largely, are not associated with a structured process. The way designers use structure and rules within a process is described by Visser (2006) as an 'opportunist' approach. Visser (1990, cited in Visser, 2006, p. 175) states that,

  "Designers may deviate from such a structured way of proceeding. We observe them to do so, and we identified and analysed the factors underlying these deviations and the resulting organisation of their activity!"

The only evidence to the fact that structure can support design activity was given in the writings of Radcliffe and Lee (1989, cited in Cross, 2001, p. 109) when they claimed,

> *"Systematic approach might help designers".*

On the contrary Fricke (1993; 1996, cited in Visser, 2006, p. 156) said,

> *"Design methodologies does not make up for a lack of engineering knowledge, but can assist in obtaining good solutions if it is applied flexibly in accordance with the problem to be solved".*

The current research involves sound epistemological choices keeping in mind the business and management research disciplines. According to Gills and Johnsons (2010), management research is a complex field, which represents interrelated tendencies with other disciplines and fields of study. The present diverse face of management research is due to its multidisciplinary and inter – disciplinary (Brown, 1997) nature and its position where it coincides with other social science studies like political science, ethnography, psychology, economics, politics, accounting, finance and most importantly in this case 'design'.

Similar to design, Gills & Johnsons (2010) claim that management research is also under threat from the 'positivist' philosophy where it is believed that the researchers are detached from the real practice of organisations and are remote individuals working on issues of little practical relevance. Researchers in management studies or design are no different from the researchers of science. Gills & Johnsons (ibid) believe that research done in the field of science is a way of producing and validating knowledge, which can be applied to managerial problems without too much difficulty. Where management uses an abductive cycle of collecting, analysing and interpreting data, design uses inductive and abductive loops to do the same (Fricke, 1996, Jonas, 2000). Jonas (2000) believes in design

theory to be a self-reflective undertaking and that must be able to deal with self-reference and paradox.

In the above claim Glanville (1997, p. 9) states,

> *"Scientific research whether experiment or theory is a design activity. We design experiments but we also act as designers in how we act in these experiments".*

Glanville (ibid p. 9) took a complete U turn and said controversially; that science should make design thinking as its model theory. Jonas (2001, p. 64-80) says that,

> *"Design research is a project-oriented research, making the design process a subject of design. There is a strong interrelation between the process of design practice and the process of design research, and just like management research, neither practitioners nor theorists like this connection".*

He originally stated that design theory must be able to deal with self-reference and paradox and it should be able to have a self-reflective undertaking.

Schön (1983) challenged the discourse of positivism in the design discipline and instead instigated the philosophy of constructivism and reflective practice. He did not agree with the theory of 'science of design' by Simon (1981, cited in Moigne and Orillard, 1994, p. 169) who believed that design was an approach towards well formed practices; whereas Shön (ibid) believed that design involved a lot of activities which were not well formed and were based on intuition, thinking, and experience instead.

Buchanan (1995) examined the subject of design and found that it is not just about professional practice but a subject of social, cultural, and philosophical

investigation. This idea is very provocative to practitioners and theorists who are not involved in the study of design. Broadening the discussion poses a bigger challenge. Since, this is where design integrates with management studies.

Gregory's (1966, p. 323) definition was,

> *"Design science is concerned with the study, investigation and accumulation of knowledge about the design process and its constituent operations. It aims to collect, organize and improve those aspects of thought and information which are available concerning design, and to specify and carry out research in those areas of design which are likely to be of value to practical designers and design organisations".*

Jonas (2000) states that design operates in between concerning itself with the relationship between people and things. It is an interface discipline between artefacts and context, between inner and outer systems.

3.1.2 Epistemological Reasoning in Management Research

Epistemology in management research is very important. Previously, researchers in management research have been criticised for not being critical and for being ill informed about their position in relation to a particular topic. Above all, practical knowledge in management is in a constant tension with the theory in the question of its applicability. No matter which management research method is chosen the sequence of problem solving is the same. Though it must be kept in mind that the management research is not straightforward like design activity. Bechhofer (1974, p. 73) states that,

> *"Clear-cut sequence of procedures following a neat pattern but a messy interaction between the conceptual and empirical world, deduction and induction occurring at the same time".*

In the first instance, the challenge for management research lies in it being swayed away from 'positivism'. Easterby-Smith et al. (2002) talks about positivism and believes that the social world exists externally and its properties cannot be measured using reflection and intuition while coexisting within the problem area. The French philosopher Comte (1858, p. 27), was able to summarize this view by saying,

> *"All good intellects have repeated, since Bacon's time, that there can be no real knowledge but that which is based on observed facts".*

This statement highlights two main assumptions:

> Positivism relates to an ontological assumption, which states that reality is objective and external from the observer.
>
> It also relates to epistemological assumption, which states that knowledge is significant only if it observes this external reality from the outside without an influence of the reality itself.

These assumptions do not hold true and valid in the sphere of management research. Philosophers within the positivist framework have debated a number of implications introduced from Comte's statement. Johnson & Duberley (2000) summed up that positivist philosophy in management research aims to generate laws, which govern the ways in which organisations operate. Donaldson (1996, p. 87,88) confirmed by stating that,

> *"A fully positivist approach would not presume to call the approach strategic management but would rather call it corporate development. It would seek to ascertain the laws that cover corporate development, that is the law that explain changes in corporate size, diversification, geographic extensiveness, innovation and so on. Attention would be paid to material factors as*

explanatory variables […] the research would be for parsimonious models utilizing as few variables as possible with the variables being of an objective kind. Subjective variables, including strategies would be included to fill in unexplained variance".

From this perspective, the sense-making and intuition that plays an important role in the field of 'strategic management', is ignored in the positivistic approach as they are unobservable and consequently cannot be validated and researched. Another criticism levelled at positivist research of management studies is its lack of being relevant (Argyris and Schön, 1996). Popper (1972a, 1972b) made one of the most relevant theories, which aimed to solve the problem of 'falsification' in scientific knowledge. This theory was called the 'Popper's hypothetico – deductive approach,' which states that no matter how much confirmatory evidence is found, one can never be certain that future observations might falsify the theory. Hence, for Popper, knowledge grows through the hypothetico-deductive process where error can be detected and removed. He also introduced the concept of critical attitude being distinguishing characteristics for science and rationality (Figure 3.2).

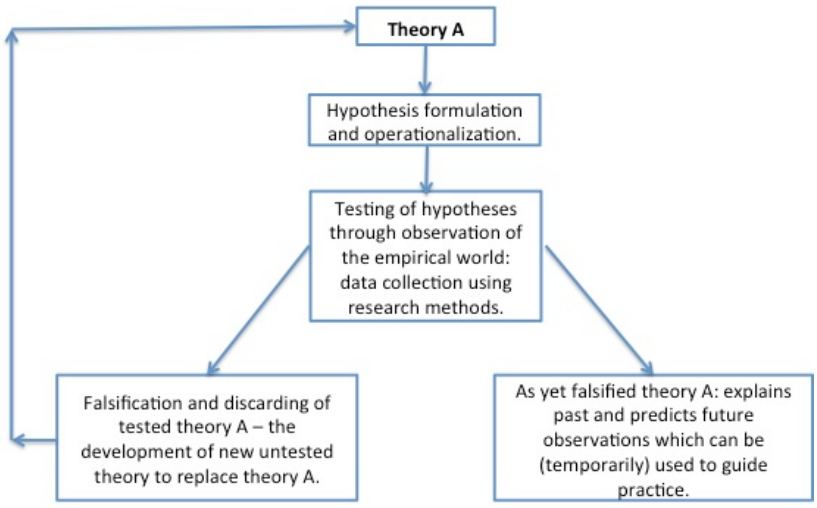

Figure 3.2: Poppers hypothetico-deductive theory. (Source: (Keat and Urry, 1982))

Many philosophies that have emerged were a consequence of the critique of positivist philosophy. The first alternative epistemological option for management

studies was the philosophy of 'conventionalism' by Keat & Urry (1982). This had a neutral observational language and talked about the eradication of the role of scientist's subjective interpretation in the acquisition of warranted knowledge. Whilst talking about conventionalism it is appropriate to include the work of Kant (1781, cited in Johnson and Duberley, 2000) who distanced himself from the naïve thinking of 'empiricism' philosophy arguing that our mind is not a receiver of sense data. According to Kant (Kant, 1781), in his book Critique of Pure Reason, we cannot have direct knowledge of reality: things in themselves, which he called '*noumena*', are by definition unperceivable and therefore unknowable.

Kant's philosophy raises 2 important questions for management researchers involved in the sphere of conventionalist philosophy (Cited in Johnson and Duberley, 2000):

- Kant's cognitive structure is a fixed property shared by and innate to all people (i.e. anthropologically), however are they derived from a different social context in which we live and thereby vary according to history and culture.
- Kant's philosophy identifies all knowledge to be phenomenological, how can we be cognitively certain that independent reality exists?

In answer to Kant's theory, Kuhn (1970) wrote a book entitled 'The Structure of Scientific Revolutions' which provides an anti-empiricist critique of positivism's key epistemological commitments amounting to a conventionalist alternative to Popper's reformulation of positivism. Central to Kuhn's (ibid) book was the concept of 'paradigm', which meant a regulative framework of metaphysical assumptions shared by members of a given community. A paradigm specifies the character of the world and its objects, and acts, as a 'disciplinary matrix' by drawing the boundaries for what the communities' work is to look like. The effect of Kuhn's theory on management studies resonates in the paradigm study of

Burrell and Morgan (1979) where they made a three-dimensional model of four paradigms applicable to an organisational research (Figure 3.3).

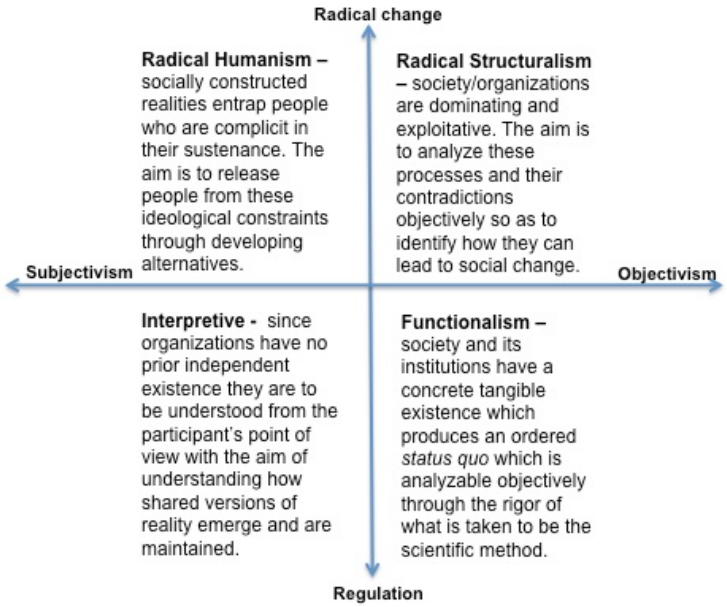

Figure 3.3: Burrell and Morgan's four paradigms. (Source: (Burrell and Morgan, 1979, p. 25))

Burrell and Morgan (1979) emphasise the need to defend incommensurability and recommend that,

> *"The four paradigms are mutually exclusive. They offer alternative views of social reality, and to understand the nature of all four is to understand four different views of society. They offer different ways of seeing. A synthesis is not possible, since in their pure forms they are contradictory, being based on at least one set of opposing meta-theoretical assumptions".*

The introduction of Burrell and Morgan's (ibid) four paradigms saw the rise of post-modernist philosophy, where they de-centre the subject and an individual is made an autonomous origin of meanings and the focus of analysis. Postmodern theorists, for the first time, made 'power' a part of the epistemological research emphasising the ability to deploy a particular scientific discourse, which reflects

the command of knowledge of a particular domain. However, the postmodern way of management research was considered to be 'parasitic' since they engaged in deconstructing and critiquing past and existing knowledge and research and did not indulge in creating new empirical approaches.

Postmodern philosophy led to the introduction of ethnography in management research. The postmodern perspective aimed to increase understanding of local practices as opposed to the development of generalisable theory (Johnson and Duberley, 2000). Ethnographic research in management focuses on the study of how people behave, collaborate and communicate in observable and regular ways (Dalton, 1959). One of the earlier works of ethnographical research in management research was the work of Dalton (ibid) who immersed himself in the study of the cultures of three manufacturing firms and one departmental store. His focus was on finding problems that arose from the gap between unofficial and official ways of doing things. By the end of his research, Dalton (ibid) concluded that his choice of mixed scientific methods with participatory observation allowed access to the information encrypted in secrecy and controversy and hence not accessible to the outsiders.

Following post-modern management studies, a lot of new philosophies were introduced to answer the challenges posed by positivistic philosophy. In the midst of the above debates, the question was raised on ontological grounds whether or not certain phenomenon exists independently. The question of perception and knowledge came into being which was answered by the philosophy of 'realism'. The realist assumption about the ontological status of any phenomenon can be assumed to constitute a social reality, which entails the view that they exist independent of our perpetual or cognitive structures. Hence, realists like Trigg (1980, p. vii) reject the view that the world is created by the mind of human observers. Later we see the emergence of 'pragmatism' under the umbrella of postmodernist philosophy. Sayer (1984, p. 85) proclaimed,

> *"The existence of social construction of any science and these social constructions being bounded by the tolerance of an external reality which exists independently of our cognitive processes".*

The most prominent philosophy that developed under the new paradigm, largely to the reaction of the application of positivism, was 'constructivism'. By paradigm I mean a set of ideas appropriate for a particular context of research. This new paradigm believed that reality is not objective or external to the observer, but is socially constructed and given meaning by the people involved in it. Constructivism in management studies grew due to its multidisciplinary nature, and due to the support that philosophy provided in constructing knowledge based on observations and experiences of practice. The constructivist approach also gave the freedom to use 'reflective practice' as one of the scientific methods of enquiry. Habermas (1974a) for constructivism promoted the idea of focusing attention on people and what they think and feel individually and collectively, and on the ways they communicate with each other, verbally and non verbally. This philosophy urged researchers to explain human behaviour and what influences it.

The following paragraphs will provide details about why certain choices were made for this research.

3.2 Action Research

The current research has involved an inductive approach of the management research under the banner of constructivism and has also incorporated the abductive thinking (Habermas, 1974a) of a design research. This has been done to enable the inclusion of general conclusions from past data relevant to the research and the introduction of 'insight' as a new knowledge gathered intuitively during the management research. To enable a logical construction of theory between the loops

of abductive and inductive thinking, I selected action research as a methodological approach (Figure 3.4).

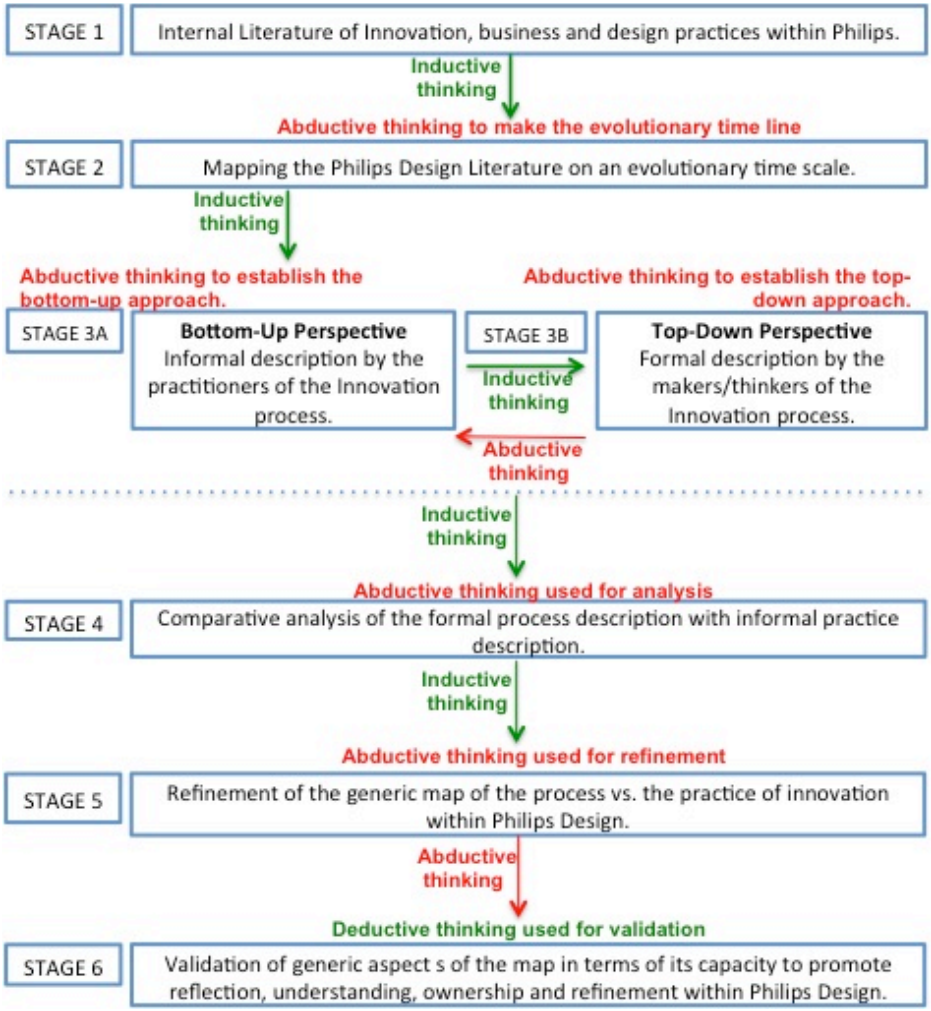

Figure 3.4: Inductive and abductive loops during Case Study research.

Action research democratically allowed justification of claims made to knowledge by production of authentic and validated evidence. Following which, claims are subject to critical evaluation (Habermas, 1974a).

McNiff and Whitehead (2006) describe action research being initiated in the 1930's from the work of Collier, who was commissioner of Indian affairs. Collier (cited in Mcniff and Whitehead, 2006, p. 41) stated that high motivation is seen when people or practitioners are involved in the decision-making process about how the workplace is run. Later, in Lewin (1941, cited in Mcniff and Whitehead,

2006, p. 21, 41), a social psychologist, developed the cycle of action reflection, which was later picked up by educationalists like Corey (1953, cited in Mcniff and Whitehead, 2006, p. 42).

Epistemologically, research is divided into paradigms, of which they are categorised by various epistemological and methodological developments. I concur with Lakatos'(1970, cited in Mcniff and Whitehead, 2006, p. 45, 264) theory that paradigms change due to the incorporation of old ideas into new ones, against the view of Kuhn (1970, p. 175) who maintained that paradigm change is often a case of choosing a new theory over the old. Theorists, like Ernest (1994), identify three broad paradigms in today's research, namely; empirical research (technical), interpretive research, and critical theoretic research. Critical theory asks the question 'how can the situation be understood in order to change it,' action research took it one step further and asked the next important question; 'how can the situation be changed' (Kuhn, 1970). Action research developed from the paradigm of critical theory and this is the focus for the study.

The question of action research is based on intellectual and social freedom where the researcher presumes that people are capable of taking decisions on their own and their decisions are influenced by their beliefs (ibid). The evaluation process in action research poses the challenge of being considered neutral or biased. The evaluation process is not only to evaluate the validity of the researcher's work but also the validity of the researcher's claims that they are able to do the job (ibid).

3.2.1 Knowledge in Action Research

Studying an organisation involves gathering knowledge from different levels. Ryle and Dennett (2000) divided this knowledge into three broad categories; propositional, procedural and personal (or tacit). Problems arise when one type of knowledge is given more emphasis than another. A good study involves gathering

knowledge from all areas of the organisation, since they are intimately interrelated and, therefore, difficult to understand separately.

Another aspect of knowledge in organisation action research is 'critical theory'. According to Brookfield (1987) critical theory challenges people to question the status quo but this does not come without the risks of backlash. Keeney, Hasson et. al (2011) add that thinking critically is about learning through self-reflection (2001). It should not be forgotten that critique is the most important ingredient for an evolution of good order.

In action research, the notion of power is considered to be a form of knowledge. There is an implicit relationship between power and knowledge as shown in the figure 3.5. To illustrate this, I compared the works of those who have been key contributors to this debate like Gevanta (1980) and Schön (1983). Gevanta (1980, p. 73, 75, 77) has drawn some conclusions from the rebellion and power play among the mining communities in rural Appalachia, (cited in Lukes, 1974). From the work of Foucault (1977) emerged the relational view of power. I conform to Dahl (cited in Lukes, 1974, p. 11) who believes that power is not a product of conflict between two players but power is a consequence of knowledge and vice versa.

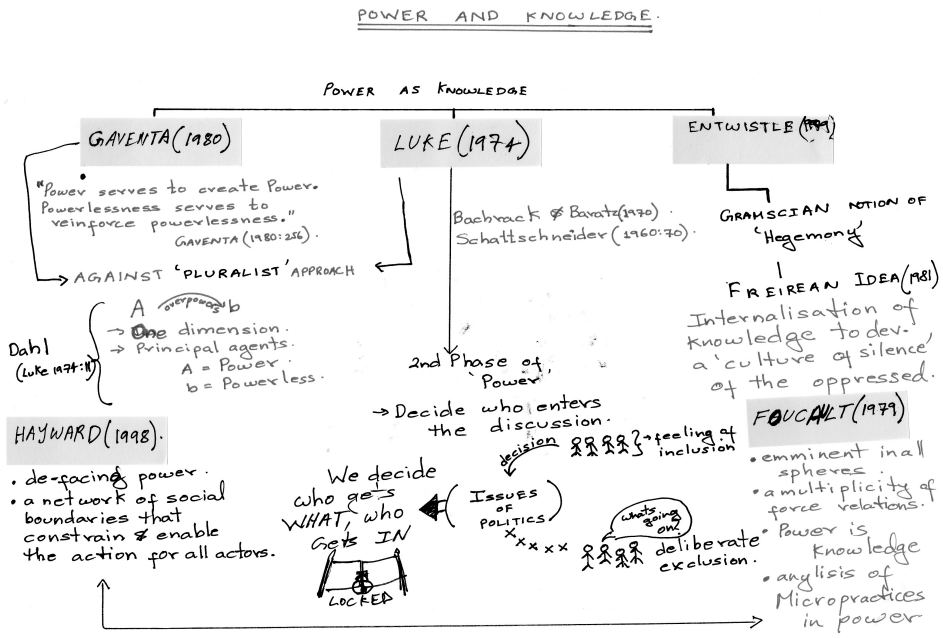

Figure 3.5: Mapping of comparison of power and knowledge.

Elaborating further on the relationship between power and knowledge in action research, knowledge is used as a resource to mobilise a sound decision-making processes, and power is used to decide who produces knowledge with the key actors in the decision process. This phase has less impact on the awareness of the powerless (Schattschneider, 1960, p. 70 , Gevanta, 1980). In action research, power can also be used to support actors involved in the decision making process. In addition, knowledge can be restricted to certain actors whose participation is considered to be unnecessary (Bachrach and Baratz, 1970). Additionally, power can be used to emphasise the way knowledge is produced and awareness is built. This could result in authentic self-consciousness of ones issues and capacities for action (Lukes, 1974).

In contrast, Foucault (1977) states that power is eminent in all spheres of life and he reflects on the multiplicity of forces of its influence. Power does not emanate in any one direction but can reverberate in all directions. His analysis of the micro

practices of power made him conclude that ‘power is knowledge’. On the contrary, Hayward (1998) insists on a positive note of power, where power exercised by actor A, could be necessary or beneficial for Actor B. She talks about de-facing power where power is a network of social boundaries that constrains and enables action for all actors. All these views have led me to the conclusion that power influences the way knowledge is established in a social environment and also how, when and with whom that knowledge is shared. Power plays a role in the generation of appropriate knowledge, and knowledge brings awareness, which in itself provides power of acquiring knowledge. How these aspects of power and knowledge are used in action research to the benefit of the researcher to complete the project on time is a big challenge.

3.3 Initial Research Stances and a Shift In Thinking

As a fashion designer and retail visual merchandiser, I found it very difficult to choose epistemologically sound methodologies to fit my thought process and work. My ‘designerly’ ways of conducting research and doing work did not practically fit into any philosophies of social science/science. My chosen methodologies consisted of steps, tools or processes that would make my work easier, as they were more focused primarily on ‘doing’.

My masters in design management inspired me to take an initial stance on epistemological philosophy and I got drawn towards empiricism. Empiricism helped me in conducting, sound research for the successful completion of my master’s thesis. The methods chosen for the study helped me understand the importance of observation and experience by being a part of the discussion and the environment.

My final design management project inspired me to undertake PhD research with an opportunity to be in a field study at Philips Design. The field study work gave

me an opportunity to experience and map the process that design takes at the corporate level to influence breakthrough decisions and enable innovations. As a researcher at Philips Design, my observations regarding individual behaviour, internal politics, informal ways of communication etc., helped me in recording correct and valid information in a smooth and timely progress of my work.

The research underwent a shift when the 'case study' was completed and I shifted my base to Northumbria University. In the next phase of the research, I was involved in making sense of the data collected at Philips Design and aligning it with relevant literature. I conducted further interviews with three organisations to explore the implications that surfaced from the collected data. Making sense of the collected data and aligning it with the literature posed one of the biggest challenges.

3.4 Primary Data

The doctoral research began with a field study. The field study was the source of all the primary data collection during which time I was a participatory observer in the organisation for nine months. I used a case study approach (Yin, 1993) as an overarching method to gather data during the field study. Within the study, the research involved using the Delphi technique (Sackman, 1974), one on one interviews and participatory observation to collect data. Attending workshops with the multidisciplinary design team within the organisation enabled me to gather practical insights on the 'ways of working' of the thinkers and practitioners.

Philips Design maintains a running record of all their work in the form of PowerPoint and internal process papers, and this data was collected to form the initial literature for review. Delphi technique helped the refinement and the analysis of the formal process description by the 'thinkers' against the informal process description by the 'practitioners'.

One-on-one interviews helped in getting first hand information and insights from the owners of the process and sub-processes.

3.5 Case Study Method

According to Yin (2003, p. 23),

> *"A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident".*

Case study research is a form of social science research; it can be qualitative or quantitative in nature. In the case study of Philips Design, I chose to take a qualitative approach. Yin (2003, p. 46) claims that when a researcher aims to; define topics broadly not narrowly, cover contextual conditions and not just phenomenon of study, and rely on multiple and not just singular sources of evidence, then this case study method is appropriate. The current case study method comprised a mixture of different methods for data collection, data analysis and data visualisation/communication. Structuring the case study to fit the current research required a set of different strategies.

According to Yin (2003),

> *"The case study inquiry copes with technically distinctive situations in which there will be many more variables of interest than data point, and as one result relies on multiple sources of evidence, with data points needing to converge in a triangulating fashion, and as another result benefits from prior development of theoretical propositions to guide data collection and analysis."*

The Philips Design case study had a number of challenges including methodological issues that had to be accounted for and will be further defined in

chapter 4. Due to the richness of a large number of variables in the case study, different methods had to be introduced during and after it to identify the data as reliable. To address the question of reliability, generalizability and repeatability of the data a method of data triangulation was adopted.

3.5.1 Administrating the Delphi Approach

The Delphi technique was used to validate the data collected during the case study and also helped in mapping the innovation process being followed at the strategic level in Philips Design. As a facilitator, it was very hard to get stakeholders to agree on a single version of the 'design innovation process map', but Delphi technique helped in achieving the goal.

During the case study I experienced the existence of a gap between the thinkers who find new options for the emerging business, and practitioners who work to defend the core business. Keeping that in mind, these two groups of people were put into discussion separately. There were a lot of reasons for the two groups to use separate Delphi techniques. One of the most prominent reasons was to get correct information from individuals without the fear of authority, bias and prejudice, which can be a big part of any corporate environment. The second reason was to enable myself to control the discussion rather than letting the discussion be controlled by power play. Administration of the Delphi technique highlights the influence of structure and culture of Philips Design's RD&I team on the case study research design.

The 'thinkers' who joined the Delphi technique were the:

- Vice President of Philips Design,
- Head of the research development and innovation team,
- Programme coordinator of this research project,
- Head operational and audit officer for Philips Design.

The head of strategy and futures thinking and scoping, also my supervisor at Philips Design, acted as a facilitator on a number of occasions and his valuable inputs were also recorded.

The 'practitioners' who joined the discussions were the:

- Head of business development at Philips Design
- Head of the probe department within Philips Design RD&I team
- Head of strategy and futures thinking and scoping

The sessions with the thinkers and practitioners took place on a weekly basis. Many iterations of the Delphi technique had to be done with the thinkers to come to a final consensus on the mapping of the innovation process. The Delphi technique opened my eyes to the hard decisions thinkers have to take in order to ensure that a process can sustain external and internal influences. The number of iterations of the Delphi technique for the practitioners were more easy to handle and less in number. The practitioners collectively did not recognise, nor took ownership of the process but still were following it.

The Delphi technique helped in generating the first maps of the innovation process, which were made on excel sheets with a lot of detail. The fluidity of the innovation process led me and my supervisors to preselect seven variables on the basis of which the 'design innovation process map' would be generated. The variables were chosen while being mindful of the requirements of the research and the requirements of the audit team at Philips Design. The 'design innovation process map' had to be developed in great detail. I chose one-on-one interviews as an additional method to make this map more accurate and valid.

3.5.2 Administering One on One Interviews – a reflection

One-on-one interviews were arranged throughout the case study to capture individual narration of the process description and challenges. Previously, these interviews were structured and allowed very little flexibility to the interviewer and the interviewee. This was done to ensure adherence to the focus and timeliness. Later, due to questions arising on the validity and reliability of gathered data and availability of more time, these interviews were changed to be semi-structured in nature.

The advantage of being at Philips Design for the case study made conducting interviews very convenient. I had to grab the opportunity to interview individual thinkers and practitioners on every occasion. In such a constructed situation, even a coffee break was an opportunity for a short and precise interview and a tool for data gathering.

I started the case study framework with structured interviews. The innovation process at Philips Design was a complicated system and there were a lot of interlinked issues that went beyond the scope of my research. Hence, at that time, structured interviews seemed to be the best framework of enquiry to ensure that interviewees answered all the questions with accuracy and with the least flexibility to meander to unrelated topics. Later, I observed that the mere structure of the interview was causing interviewees to get intimidated by the subjects and made them give answers that were biased or not valid in many contexts.

Keeping the above in mind, I changed the questionnaire format to semi-structured. The semi-structured format ensured that the interviewees were comfortable and gave answers without bias and external influence. This was implemented through all phases of the research and all data used in the final analysis conformed to the final format of semi-structured interviews to avoid any biased responses.

3.6 Mixed Method Research Design

The research used mixed methods to collect and analyse data (Figure 3.6). The data collection methods include multiple methods like case study, Delphi technique, one-on-one interviews, and literature review grouped together under an action research cycle. The data validation process includes exploration of other organisations and data triangulation with a third party expert. The qualitative nature of the data led to a complex data analysis supported by 'designerly' methods of mapping, shown later in chapter 7.

Figure 3.6: Mixed method research.

The use of the above mentioned mixed methods helped me keep data collection and data analysis methods consistent. The advocation of the use of mixed methods in the same study also known as the 'methodologically pluralist' (Gills and Johnson, 2010) approach, suggested that there are not any fundamental irreconcilable conflicts between quantitative and qualitative methods. Triangulated

findings led to more accurate data as they were sighted from different methodological backgrounds.

Mixing methods allowed me to balance the shortcomings of research methods with the advantages of other methods selected for the same phenomenon of research. All interviews were semi-structured instead of structured to enable detailed discussions and non-interruption of the conversations. Another example relates to selecting the Delphi technique over another data collection technique called Group Feedback Analysis (Denzin, 1970). The reason behind the selection was that Group Feedback Analysis was not able to provide the flexibility and power to the facilitator and put most power in the hands of the participants. On the other hand, the Delphi technique helped to accommodate a larger group, for a long period of time, and helped in making iterative changes to the description of the 'design innovation process' with full consensus of the thinkers and the practitioners. This would have not been possible with Group Feedback Analysis.

Denzin (1970, p. 291) defined methodological triangulation as,

> *"The combination of methodologies in the study of the same phenomenon".*

Due to the use of a the case study method, empirical research focused on understanding and investigating the innovation process in order to define and refine it, within the context of a real life design setting. These settings use multiple sources of evidence, and multiple data were used to carry out a successful case study research.

To help give a better understanding of the research design, the phases and the reflective loops within the research are shown in figure 3.7.

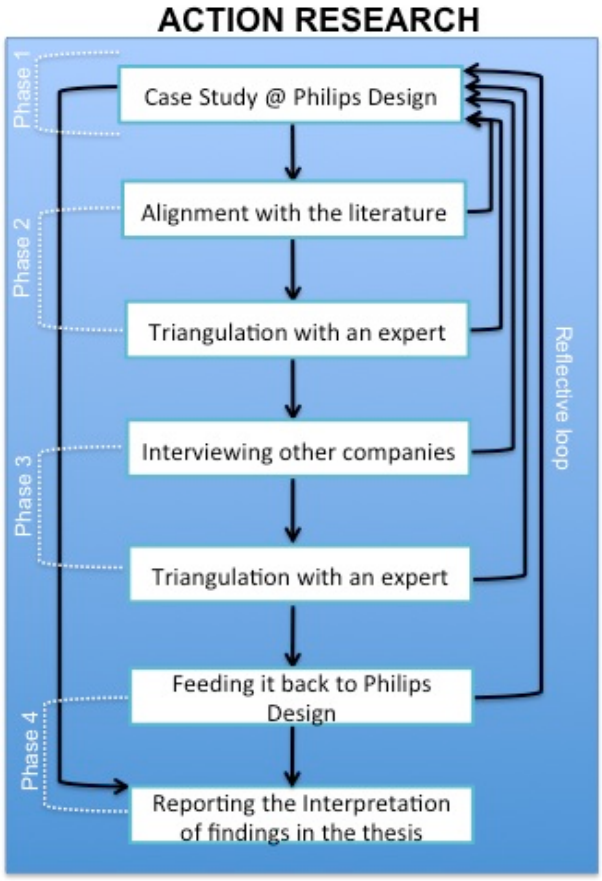

Figure 3.7: Research design framework.

As stated earlier, the research began its first phase with me being stationed as a participatory observer at Philips Design. The action research cycle began with the case study where I was involved in the first two stages of the Philips Design innovation process along with the RD&I team. During phase one, the innovation process was mapped and feedback was given to Philips Design and other stakeholders at Philips. Following which my research shifted focus to understanding the broader applications of the outputs that emerged from the 9 months internship at Philips Design. The 2nd phase of my research required me to align the practice of Philips Designs RD&I team with the closest theory and to triangulate these data with a third party expert. On completion of the 2nd phase, I needed to explore other organisations similar or different from Philips Design and outline the various roles design plays in multinational organisations. The data gathered from the exploration of three other organisations and the data collected at the case study was again triangulated with a third party expert. Following which

feedback was provided to Philips Design and the outcome was made explicit in a thesis in the 4th phase.

During this 4-phased research journey, the role of Philips Design was prominent in certain parts. Figure 3.8 highlights at what level Philips Design influenced the decision making process of research design.

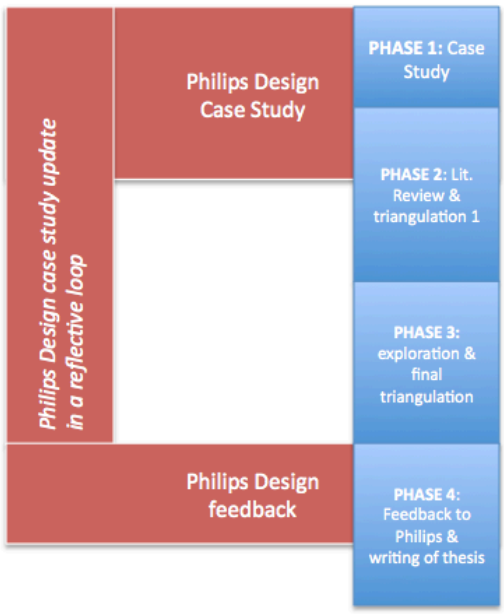

Figure 3.8: Philips influence at different phases of the study.

The research design for the case study was partially influenced by the requirements of Philips Design. As stated in section 3.5.1 and 3.5.2 the structure and culture of Philips Design and the RD&I team influenced the case study research design. Philips Design also recommended literature that influenced them in their practice. Hence, phase 2 aligned the practice of Philips Design with the literature suggested by them. Finally, Philips Design's feedback in phase 4 influenced the conclusion of the research and inspired me to think about the influence of; culture, individual performance, rate of adaptiveness, time and market on the ability of design to establish itself as a functional leader (discussed in detail in chapter 9).

3.7 Capturing Implicit Knowledge: Lack of Action Research by Philips Design

The research design followed a pattern of feeding information and data about the case study outcomes to further refine the content, leading to its enrichment. Figure 3.7 shows the reflective loops and the phases of the research.

The case study at Philips Design was a part of the 'design functional leadership development programme' in the organisational research study of Philips Corporation. Although a designer's perspective was used to understand the organisational design, the main challenge was to capture implicit managerial art, skills and understanding and make it available for other employees. As stated by Schön (2003, p. 237);

> *"Managers reflect-in-action just like other professions, but seldom do they reflect on their reflection-in-action process. This makes their skills and thinking private and inaccessible to others".*

The project was set out to solve this particular problem of tacit knowledge in the strategic design team.

3.7.1 Reflection in Action: A Strategy to Capture Implicit Knowledge

I went about solving the problem of capturing the implicit knowledge at Philips by audio recording each Delphi session and using one-on-one interviews and transcribing the records. The changes that were made to the 'design innovation process map' during the Delphi and one-on-one interview sessions were recorded on an excel template and distributed to the participants. I also encouraged the participants to draw their thoughts, while they talked on paper, that, I later saved as data. Several casual conversations, and observations, throughout the nine months

of internship were also transcribed and stored as data. To make all this possible, initially, I had to gain the trust of the team, understand the individual psychology of participants, and motivate them to participate in the case study. This was possible by being a part of the community of Philips employees at a professional as well as social level and join in all social gatherings of the team as well as the organisation.

The above strategies were complimented by the reflection–in–action process that enabled me to review the construction of the problem, the action, the strategies, and models of understanding, which might have been implicit in the research. In this research, reflection-in-action helped in redesigning it and making the process and each phase coherent. The most prominent feature of the method design was the overlap of data analysis with data collection at every stage. Eisenhardt (1989) added that this overlap is maintained and helped in building a theory as the research study developed. This enabled me to improve the research design while it was being carried out.

According to Greenwood (1993, p. 1185),

> *"To think about what one is doing whilst one is doing it; it is typically stimulated by surprise, by something which puzzled the practitioner concerned".*

Further, I also used the model of reflection-on-action to self reflect. It enabled me to challenge my beliefs and experiences and change the way I think. As suggested by Boyd & Fales (1983, p. 101), reflection on action is,

> *"The process of creating and clarifying the meaning of experiences in terms of self in relation to both self and world. The outcome of this process is changed conceptual perspective. The experience that is explored and examined to*

create meaning focuses around or embodies a concern of central importance to self".

In the later stages of the study, I was involved in two simultaneous actions: refining the definition of the construct, and building evidence that measures the construct in each case. I also planned my actions before starting to act on them, by defining how the work is going to progress.

The models of reflective practice for my research are depicted in appendix 2. The following paragraphs briefly discuss all phases of the research.

3.7.2 Phase One: Case Study

The case study investigated how to effectively map the innovation process and its practices in a multinational organisation, to promote reflection, understanding, ownership, and refinement by stakeholders within the organisation. It went about this by making a detailed case study of the innovation process and practices within Philips Design.

According to Price (2009) of the Philips Design Idea Engine,

> *"Philips Design Innovation is led by a multidisciplinary design group who take research insight through to a market conclusion. Unlike product development its main aim is not to generate things, i.e. products and features although these do get created as a by-product. Unlike technology exploration its main aim is not to generate intellectual property, i.e. protectable inventions, although it does create them as a by-product. Unlike futures research its main aim is not to articulate possibilities with any application in the present day other than as provocations. The aim of innovation is to create business ventures or components that will add to and enhance business ventures".*

Philips Design underwent substantial changes to establish design as a key decision-making function within the organisation. Thus, Philips Design management wanted to use design research to build an integrated framework of the innovation process and its actual practices within the business function in the form of a 'process map' that later was called 'design innovation process map'. Making the process explicit also helped to build and promote understanding of the process with specialist innovation practitioners and managers within Philips Design. This, in turn, reinforced the learning cycle within the culture, and helped promote evaluation and reflection, leading to further refinement. It was also envisioned that it might help in training people who join the culture of the innovation process in the future. Moreover, it added value to Philips as an organisational differentiator making the uniqueness of the process stand out in comparison to other corporations.

3.7.3 Phase Two: Revisiting Literature And Triangulation

After the completion of the case study, I transferred my research to the School of Design at Northumbria University where I revisited the literature. The literature search was a challenging task as it was difficult to find theory on innovation driven by design.

During the case study I was introduced to the work of Verganti (2009) and his book, "Design Driven Innovation" which I found was, the closest in relation to the research. With the establishment of a correlation within the literature, I had to take up the task of triangulating the outcome and observations of the case study against the literature study with a third party expert. The third party expert was chosen as he had been key to the innovation process at Philips Design and also was knowledgeable about other innovation processes in other organisations outside of the organisation.

Triangulation of the data helped validate the generic aspects of the 'design innovation process map' in terms of its capacity to promote reflection, understanding, ownership, and refinement with a critical eye. It also helped in highlighting critical questions and observations. These are described in Chapters 4 and 7 respectively.

The process of triangulation exposed critical gaps in the knowledge and helped in the decision to build the research further. The outcomes of the case study were not very clear at this stage but this dilemma was instantly solved after the first phase of data triangulation. The first phase of triangulation directed me towards exploring the role of design in other comparable organisations. It meant that I had to take an extensive exploration exercise and interview executives from companies that were either very similar to Philips Design or contrasted them. The outcomes had a significant effect on the conclusions and recommendations made to Philips Design. These are described in Chapter 7 and 8 respectively.

3.7.4 Phase Three: Interviews with Other Companies and Triangulation

An important task performed before interviewing companies was to choose selection criteria to shortlist companies suitable to be explored (Chapter 1, Section 1.8.2). The next task was to contact the companies. Making personal contacts was a slow process with a low success rate. The executives at the strategic level were difficult to reach and to communicate with. Hence, I had to plan a new strategy of volunteering as a transcriber to big industrial conferences and meet representatives of most selected organisations. In order to do that, an extensive search was done on all industrial conferences, noting their participants, their names and their work in the chosen organisations.

This strategy saved time, resources and enabled interviews to be held to meet the research plan effectively. Once all interviews had been completed, the data was

compared and contrasted and then triangulated against the outcome of the previous triangulation and the third party expert was again involved to validate the outcomes. This stage of triangulation concluded the research by validating the findings. After this 2nd triangulation I had to draw conclusions and give feedback to Philips Design.

3.7.5 Phase Four: Feedback

The final loop in the reflective action research was to give feedback to Philips Design the final results and recommendations for their innovation process. This loop also incorporated the task of data analysis and making sense of the information gathered throughout the research.

At this stage, presentation of the data to the audience was very important. Philips Design is driven by commercial practices and outcomes. Hence, the mode of presentation of data needed to be different from the presentation of the data in the thesis. Difficult choices had to be made to come up with the mode of communication for both parties.

This stage established the research's applicability in practice as well as in theory.

3.8 Importance of Conferences and Industrial Engagement

Attending conferences was not merely for the purpose of practical and developmental knowledge but as part of the research strategy. As stated in section 3.7.4, it was difficult to get time from individuals involved in strategic decision-making processes. Attending industrial conferences as a volunteer, reporter and a transcriber was a good way to get access to key industrial personnel.

The summary of these academic conferences can be seen in appendix 1. As most industrial conferences do not allow student participation, I was fortunate to get entry as a volunteer in an industrial conference named 'Design means Business' in

Newcastle Upon Tyne. At the conference I got to see the role of design in small and medium enterprises (SME's) and bigger companies in the North East of England. The conference also gave me an opportunity to conduct interviews to get different organisation's viewpoints on my research ideas and views on design's role in strategically shaping the future of organisations as well as driving innovation.

Another conference where I was chosen to be one of the six participants from around Europe was 'Open Innovation and New Business Creation' in Lego Land, Billund. This conference gave me the opportunity to witness the innovation process being carried out by big corporations like Lego, Company C, Company A, Ericsson, Company B and many more. This also gave me the opportunity to interview a number of managers of innovation in big corporations at the strategic level. The conference was not just a good source for knowledge but also for its networking opportunities. The paper submitted to the conference can be seen in appendix 22.

These interviews were conducted at the venue by making prior appointments after conference hours. The selected participants from chosen companies showed a lot of enthusiasm and agreed their full participation.

Therefore, industrial conferences helped me gather data and explore other organisations and gave me the opportunity to get an industrial point of view on my research. Apart from industrial conferences, I also got an opportunity to be a part of a research conference by the CiNet Group in Denmark called 'Continuous Innovation: Doing more with less'. The conference came at the time when I was struggling with the interpretation of findings in my research. The paper submitted at the conference can be seen in appendix 22. A critique on my paper and presentation at the conference led me to make better choices in my interpretation of the final findings for the research study.

3.9 Peer Reviews

Peer reviews gave me a way to refine my thought process and the design of the research. The School of Design conducts peer reviews internally, which are attended by research staff and research students. These internal peer reviews were effective to practice presentation skills and get feedback from different perspectives.

Presenting at research conferences also proved to be great for the review of my work. The advantage in presenting at research conferences was to receive feedback from multidisciplinary audiences. Papers presented at the conferences are in Appendices 25, 26 and 27.

SUMMARY

This chapter has highlighted the positions I have taken regarding the epistemological and ontological evidence in the field of design and management research. It pointed out that the study was carried out with a constructivist epistemological approach and post-modernist ontology. It highlighted the ambiguity that the research started with and how the fuzzy ends were streamlined into a strong robust selection of research methodology for the study and the challenges faced in adhering to the methods and processes at the case study setting in Philips Design.

Philips Design management's lack of using action research led to the internal transfer of knowledge that was mostly implicit. The reflection-in-action approach carried out captured this implicit knowledge and converted it into explicit data. The data was collected in the form of sketches, notes, audio recordings, and excel sheet maps. The internal two-way loop made the research more robust. All data in the research had been validated and peer reviewed at least twice at every stage.

Use of mixed methods helped make the research design rigorous through triangulation. Attending conferences was beneficial in meeting with selected organisation respondents and getting first hand feedback. Peer reviews by staff and colleagues at Northumbria University helped to refine the ideas, methods, and flow of the research.

Over all, the research design made it possible to validate the theory and practical information gathered during the case study. This made it possible to provide useful feedback and recommendations to Philips Design and draw generic conclusions to the research.

CASE STUDY AT PHILIPS

DESIGN: METHODS, CHALLENGES AND OUTCOMES

CHAPTER FOUR: CASE STUDY AT PHILIPS DESIGN

The stage of problem definition and data collection was done at Philips Design where I was stationed for an internship for nine months of my PhD study. The project required me to map, refine and define the innovation process taking place at the strategic level of Philips Design. The goal was to enable ownership of the process by the practitioners and stakeholders, and to help the research development and innovation team (RD&I) at Philips Design generate value propositions for the organisation.

The methods were chosen as a consequence of the iterative nature of the research and the influence of external collaborators at Philips Design. Due to the involvement of Philips Design, these methods were altered to suit the environment.

This chapter highlights the project by giving detail about the data collected during this case study research. It goes about explaining the problem area and the reason behind Philips Design taking up this project. Later, it goes on to describe how I conducted the study and highlights the challenges encountered. It closes with the acquired learning and conclusions that allowed the study to reach a deeper understanding of the innovation processes in a corporate environment.

4.1 Introduction to Innovation at Philips Design

Philips Design is one of the largest and oldest design-oriented companies globally, with design studios in Europe, Asia and America. It designs products while keeping people's needs as its primary focus. Design at Philips has evolved from being a subordinate contract-based[42] function where it was solely involved in

[42] Contract-based – Design is not a part of the organisational structure but works as an external entity. Design as a contract-based entity is called in to work on specific projects over a limited time period. The designer's do not have any control on how the organisation works and no role in formulating strategy. It was only in 2008 that Man and Jung

incremental and product innovation, to being recognised as one of the functions that drives innovation within the organisation. Philips is driving to put design as a functional leader in the organisation to extend its value to other disciplines. The key elements of the strategy used by Philips Design are;

- Quantum leaps that enable breakthroughs in product/service innovation,
- Improved product solutions that are enabled by better analysis of users' needs,
- Radical innovation that provides meaning to a product/service systems, and improves the user's experience of the product/service system and their perception of the Philips brand.

Philips Design bases its innovation process on understanding and tracking socio-cultural paradigm changes. It is on these that they make all future theme decisions. The process lacks definition of roles and actions, and communication takes place implicitly[43] and on an ad-hoc basis. Philips Design collaborates with other functional leaders within the company, including those from strategy, marketing and technology, to incorporate ideas and assets from the Philips at large and to deliver on its proposed themes and innovation portfolio. Philips integrates the design-led innovation process into its operations at many levels.

The Philips Design innovation process has evolved over time and there was a need to make the implicit process more explicit. The company had identified the need for an explicit review to map the way innovation is being carried out presently, keeping in mind past evolutions and landmarks, communication channels, specific roles and ownership of the steps within it. While mapping the process, the

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introduced the idea of design contributing to organisational strategy while being a contract-based entity. See: Man, K. Y. & Jung, M. J. (2008) Bottom-up design leadership as a strategic tool. *Design Management Review,* 19**,** 59 - 67.

[43] Implicitly – Philips as an organisation has involved design into its strategic decision making very recently and does not have communication channels and ways of communication defined for interaction between design and other stakeholders. Most complex arguments and communication happen in an accidental manner without the intention of learning or decision-making. See: Reber, A. S. (1989) Implicit learning and tacit knowledge. *Journal of Experimental Phycology General,* 118**,** 219-235.

company also wanted the redefinition of its process names, actions and deliverables to make it more adaptable to future requirements. Therefore, the case study of Philips Design saw two groups constantly interacting with each other within the RD&I team. These groups were of the 'thinkers', individuals who were involved in making strategies for the innovation process and were involved in identifying options for emerging markets; and the 'practitioners' who were involved in defending the core business and acting on the strategies made by the thinkers. The case study was conducted with the aim of mapping the innovation process thought to be operating from the organisational process perspective (thinkers) and from the practitioner's perspective.

I anticipated that making the process explicit would help to build and promote understanding of the process with specialist innovation thinkers and practitioners within Philips Design, which in future could reinforce the learning cycle and culture and help promote evaluation and reflection and lead to further refinement. Additionally, it added value to Philips as an organisation and made the uniqueness of their process stand out in comparison to other organisations.

4.2 Philips Design – Case Study Process

Typically, mapping of innovation processes in organisations was work of management/business studies students. It was a challenge for me. The idea was to capture the most implicit knowledge that was being transferred within the team and around the company on the most ad-hoc basis, and put it within a formal structure for qualitative and qualitative analysis and reflection. Criteria taken for managerial mapping cannot be applied in mapping of the strategic design process because of the existence in design of implicit knowledge, tacit[44] skills, and design issues related to culture, behaviour and team practices.

[44] Tacit knowledge/skills – Polanyi in was the first to state that there are two kinds of knowledge. One is that can be written and transferred from one individual to another and the second is difficult to transfer in written or by even talking. Polanyi stated that tacit

As explained earlier, Philips Design had been involved in creating benchmark innovation practices and techniques for breakthrough innovations, but somehow these techniques were not being documented and passed on to the 'new ways of working[45]' and 'body of knowledge[46]' within the organisation. The role of design was undergoing a massive change within Philips strategy; there was an urgent need for Philips Design to explicitly define the process. The project was a big challenge and I sought to address the mapping issues by using creative mapping skills (Buzan and Buzan, 2007), mixed methods (Bergman, 2008) and by being a participatory observer in the research, development and innovation team (RD&I).

The mapping of the innovation process contributed to the 'review, plan and value contribution development' for Philips. This was the core process being followed at the strategic level, which integrated design within the business. The process also aimed to make a creative portfolio with added value and applications for the future. Figure 4.1 explains the positioning of the core process of 'review, plan and development of value contribution' being run by RD&I team. The core process carried out by the RD&I teams runs under the strategic process that is carried out by the PIB[47] involved in reviewing and developing design strategy for Philips. These important decisions are then transferred to the RD&I team for development and proposition of value for the creation of a creative portfolio.

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knowledge could be transferred with interaction, talking and trust. See: Polanyi, M. (1966) *The tacit dimension,* New York, Doubleday & Company, Inc.

[45] New ways of working – 'New ways of working' is a term used at Philips Design that signifies tools discovered while they carry out their innovation process. These tools help them in engaging with ground breaking innovative products in new cycles.

[46] Body of knowledge – Philips Design maps and stored all ideas and value generated in form of process papers and presentations. These papers and presentation are circulated within Philips and stored as their body of knowledge.

[47] PIB – Philips Innovation Board also known as PIB at Philips, which comprises of the head of the recognized functions along with the CEO of the organisation. These recognized functions at Philips are: strategy, technology, marketing/futures, and design. This committee takes important decisions of the organisations innovation strategy that is then transferred to the RD&I team.

The RD&I process involves other stakeholders and is followed by the support processes by other functions in the organisation. The core process of RD&I provides provision for design leadership and intelligence in Philips.

Figure 4.1: Design leadership & intelligence used as a core process in the strategic level (Gardien, 2008b).

4.2.1 Case Study Research

Case study research has been validated as a method through its use in several disciplines such as marketing, operational management, management information systems, and strategy (Dul and Hak, 2008). Dul and Hak (ibid) agree that case study research is a useful research strategy when;

- The topic is broad and highly complex,
- There is not a lot of theory available,
- The "context" is very important.

Based on these arguments, the case study involving Philips Design was in a multi-stakeholder environment where design was undergoing a massive identity change within the organisation. Philips Design is a pioneer in pushing design towards a functional role in the corporation but there is little literature to support this practice in theory. Moreover, Philips Design's process cannot be viewed in isolation from

the team and the environment they work in. The process is part of their daily life and can only be analysed when one is a part of that context. All these arguments made it very clear that case study research was the most suitable strategy to map the 'strategic innovation process' at Philips Design. Yin (1993, p. 4) explains that,

> *"The distinctive need for case studies arises out of the desire to understand complex social phenomenon. In brief, the case study method allows investigators to retain the holistic and meaningful characteristics of real-life events – such as individual life cycles, small group behaviour, organisational and managerial processes […]".*

Keeping the above definition in mind, the Philips Design project was a study where I was an observer within the organisation. My role involved making meaningful interpretation of the tacit and implicit knowledge that was being transferred on a daily basis, documenting the most informal decisions being taken within and outside the research, development and innovation team (RD&I). Hence, the research strategy taken was based on a 'practice based descriptive case study' (Dul and Hak, 2008).

4.2.2 Aims and Objectives of the Practice Based Descriptive Case Study Research

The aim of this descriptive practice oriented research is to discover and describe in detail important variables that already exist in the research question. For example in the case of Philips Design it would be "what are the effective mapping techniques?" The present study aimed at exploring theory and practice to identify specific needs in existing knowledge, as well as building this knowledge base with insight from the case study. The case study research has specific aims and objectives, which are different from the PhD study but nevertheless feed into the research study.

AIM

Develop an effective way of mapping the complex innovation systems in a multinational organisation from a design case study perspective.

OBJECTIVES

- Review of existing literature that describes innovation approaches theory and case studies of best practice, within multinational corporations.
- Arrange information on a timeline to identify its evolutionary development within the organisation over the last 10 years.
- Interview stakeholders to generate a formal management description and map of the innovation process in Philips Design (top-down perspective).
- Interview stakeholders to generate an informal practitioner description and map of innovation practices (bottom-up perspective).
- Develop a refined generic map of the process and practice of innovation within Philips Design.
- Validation of generic aspects of the map in terms of its capacity to promote reflection, understanding, ownership and refinement within Philips Design.

4.2.3 Design of the Practice-Oriented Case Study Research

As the current research did not have any specific variables defined for the case study, I explored a range of situations in which I presumed the variables could be discovered or found. Hence, the research design for this study is done keeping in mind different stages, which focused on specific goals. Each stage feeds into the analysis of the map in a reflective cycle. The case study design uses a mixed method approach to find the solution to the research problem. Mixed methods were used to gather data and finally triangulated for analysis (Olsen, 2004b).

The first decision was to select the variables on which the structure of the map would be based. These variables were selected to define the essential characteristics of the process and must be able to reflect all critical information in a readable format. In the initial meetings with multiple stakeholders, thinkers and practitioners it was not possible to come to an agreement on the names of the variables. This was due to the fact that the work pattern for each practitioner was different and there was a disagreement on the usability and usefulness of the variables. To solve this issue, I had to prioritise the reasons for the mapping process, which were narrowed down to the following:

- Making the communication and data transfer explicit,
- To enable successful audit of the design process as design was one of the functions for the company,
- To communicate the value of design within Philips by making the process visible to other stakeholders.

The final decision for selecting the variables was taken between the thinkers of the team, the members of the internal design audit committee, and myself. This group understood the importance of the mapping and were clear on its deliverables. Thus, the variables that were selected were:

- **Core process name:** This variable gives the name of the core process that is accepted by all stakeholders and members of the team.
- **Focus summary:** Provides a single line summary for the core process.
- **When – timeframe:** Gives the approximate time required to start and finish the process.
- **How – High level/steps:** Lists the entire sub-process names agreed by all stakeholders and team members.
- **Required Input:** Highlights the required inputs for the process and states who the input is taken from.

- **Key activities (Philips Design):** Documents the key activities that are done by the team during the process and its high-level sub-processes.
- **Deliverables – output:** States the typical documents that are required to be transferred. It also highlights the communication channel by specifying **CDM (Chief Design Manager) or *DM (Design Manager), ** CDM is referred to the channel that connects the domain CDM to the sector. DM is referred to the channel that connects to the cultural programme.
- **Who – Core or sub-process owner:** Specify the owner of the core process and the sub-process.
- **Who other – stakeholder(s)/functional contribution:** Other stakeholder(s) involved in the decision making process.
- **Questions/remarks/uncertainties/risks:** Any other observation made by me or other person involved in mapping for further reference.

The case study research design was practically divided into data collection, analysis, and data presentation activities, which is explained in the next section (Figure 4.2).

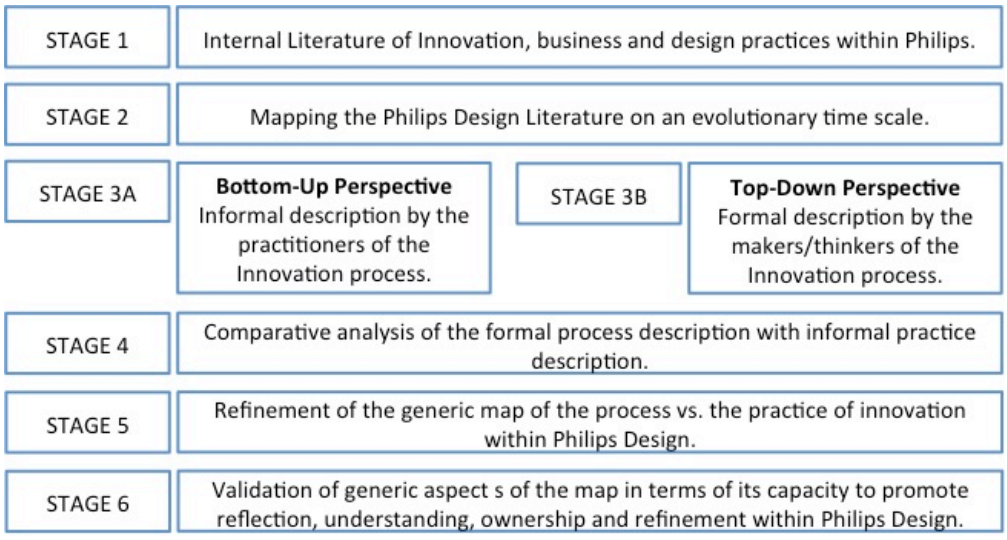

Figure 4.2: Key stages of the practice oriented descriptive case study.

4.2.3a Stage 1:

Hart (1998) proposes that a good methodology for doing practice-based case study research is to start with a literature review. Hence, the methodology starts with an internal literature review, which outlines the different concepts of innovation in use at Philips Design in the past ten years. Data relevant to the study was stored and used to interpret the evolution of the process. This data was collected from past PowerPoints, papers, experiments etc. by Philips' employees. The data from the literature was laid out on a rough map for clarity (Figure 4.3).

Figure 4.3: Putting the internal literature to help make connections and find gaps.

4.2.3b Stage 2:

To further align the literature, I put it on an evolutionary timeline (Figure 4.4). Putting the literature on an evolutionary timeline led me to connect a few gaps in the literature that were created due to the fact that people had moved from the team

or left the company. As a consequence, a lot of knowledge embedded deep in the minds of past team members was lost, and it made extraction of this information almost impossible. Additionally, most materials were not in the order of their occurrence, making it impossible to indicate the milestones in the history of usability of design at Philips Design. Unfortunately, each participants of Delphi could not be questioned in this case for the reason stated above; this was done in Stage 2.

The timeline assisted to identify connections in the literature, and also helped in organising the materials to highlight the milestones that lead to design being established as a function. The timeline eminently highlighted the work of the design department within the corporation and made it possible to visualise the rise in the role of design in innovation thinking within the organisation. In the year 2002, Philips recognised the importance of developing an understanding of people, technology and environment, and the involvement of design research for innovation. In 2004, Philips incorporated design into its value propositions, which resulted in design developing a creative portfolio. After which, design was recognised as a function and was involved in collaborating with technology and strategy functions in 2005 and 2006. Post 2006, design was seen collaborating in research on emerging markets, social innovation, health and independent living. Finally, in 2009 design was integrated into the new corporate innovation programme called the 'functional leadership programme'. In a span of ten years, design had achieved a number of milestones, the most significant of which was being recognised as an important function for the corporation.

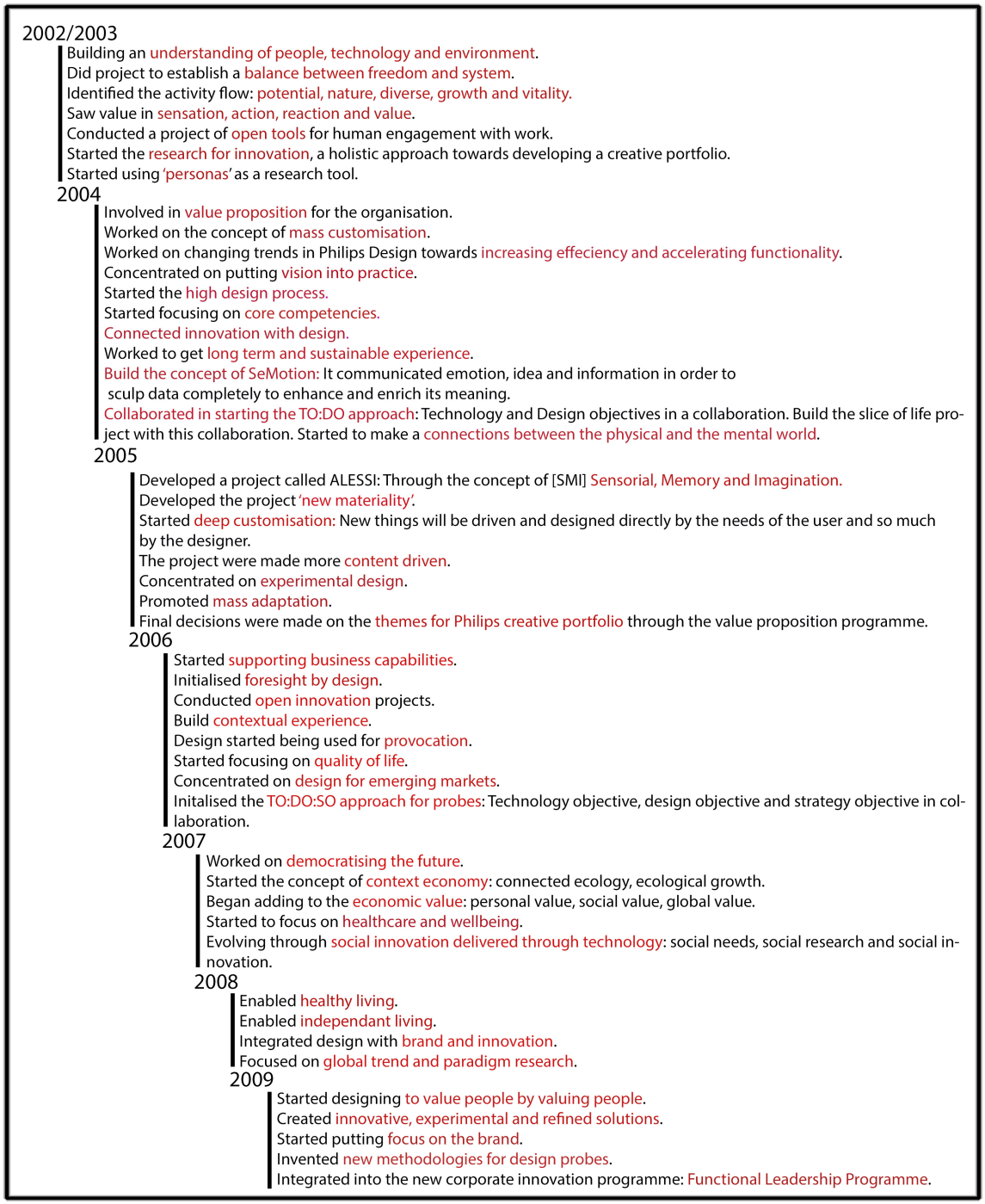

Figure 4.4: Evolutionary time-line for Philips Design from year 2002-2009.

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4.2.3c Stage 3A & 3B:

In Stage 3A, semi-structured interviews (Yin, 1993) were carried out with practitioners (appendix 6) and stakeholders (appendix 3 & 4), to record the bottom-up understanding of the design innovation process used by the practitioners, and involvement of the stakeholders in the current process, respectively.

Stage 3A and 3B also incorporated the Delphi technique and semi-structured interviews to map the current innovation process. Both the stages fed into each other to complete the information and make the map concrete. Figure 4.5 depicts the steps taken to make the data collected from the Delphi technique and interviews harmonise into an accurate map of the innovation process in several stages.

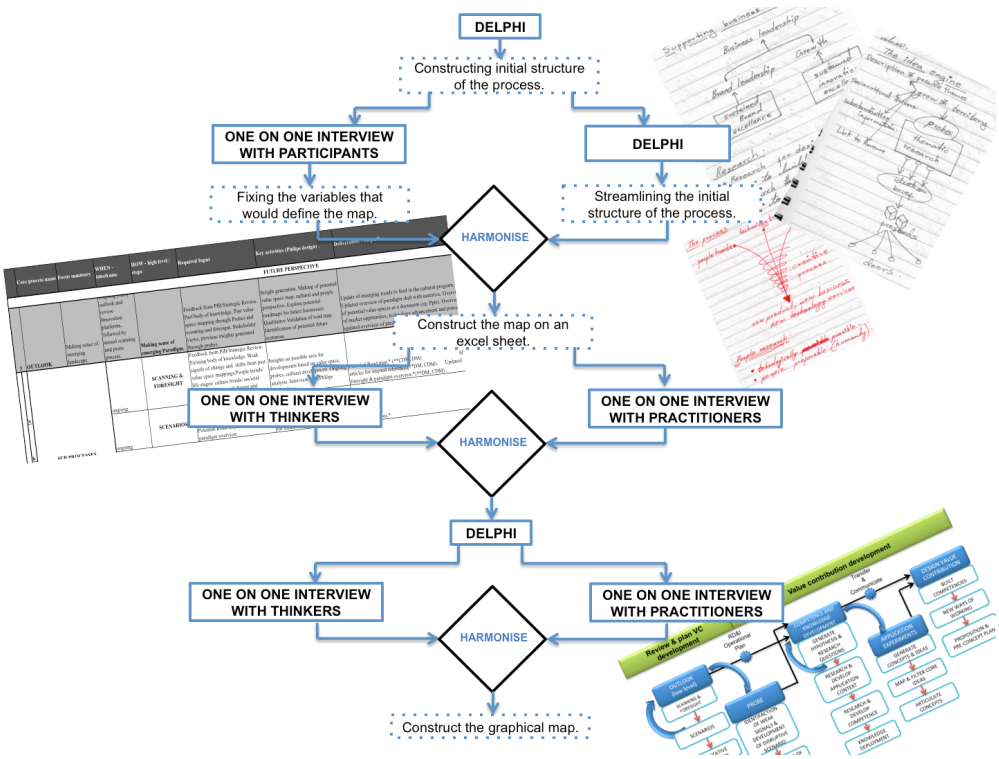

Figure 4.5: Construction of the process map using Delphi method & interviews.

Where Stage 3A started with Delphi method involving selected thinkers and practitioners (explained in chapter 3, section 3.5.1), Stage 3B recorded the way the thinkers perceived the process to be. Interviews with thinkers (appendix 5) were carried out extensively to fill the gaps and provide a better understanding of the innovation approach at Philips Design.

All the information gathered helps realise the innovation approach through graphical representation of its basic and most obvious entities (Hartley, 1982, Gunther R. Kress, 1996). This enabled the next level of the mapping process and definition of best practices. The next step required mapping minute details such as the ownership, key inputs, and key activities of the corporation's business function and design function respectively.

Once these steps were complete, it was evident that there was a visible gap between the practitioners and thinkers in the organisation. The design process perceived by the practitioners was different from that promoted by the thinkers. Furthermore, the practitioners did not feel an important part of the planning process, and lacked an ownership of the corporate goal; they viewed the process as an external entity. On the other hand, the thinkers did not involve the practitioners in the making of the process, leading to a lack of connection between the two. This will be discussed in detail in chapter 8 as one of the key findings.

4.2.3d Stage 4:

Stage 4 makes a consolidated map of the innovation process being followed at the corporate level in Philips Design. This step completed the loop and helps in the comparison of logical data against the practical data to recognise further knowledge gaps in the information. This stage also helps to identify the most important practices within the system. The details of the map were put on an excel spreadsheet together with the detailed process description. The output of this level of the methodology was laying down the information on an excel spreadsheet with labels that require detailed information of each step of the innovation process (Introduction, Section 1.3). While carrying out this step, the gap between communication and paradigm was made pertinent.

4.2.3e Stage 5 & 6:

Stage 5 refined the map at a microscopic level and constructed a simple graphical flowchart to communicate the process to other stakeholders (Figure 4.6, 4.7). Whereas in Stage 6, further one-on-one interviews and Delphi technique workshops were conducted with the thinkers, practitioners and stakeholders to validate the map within Philips Design (for questionnaire and transcripts refer to appendix 4, 5, 6 & 7).

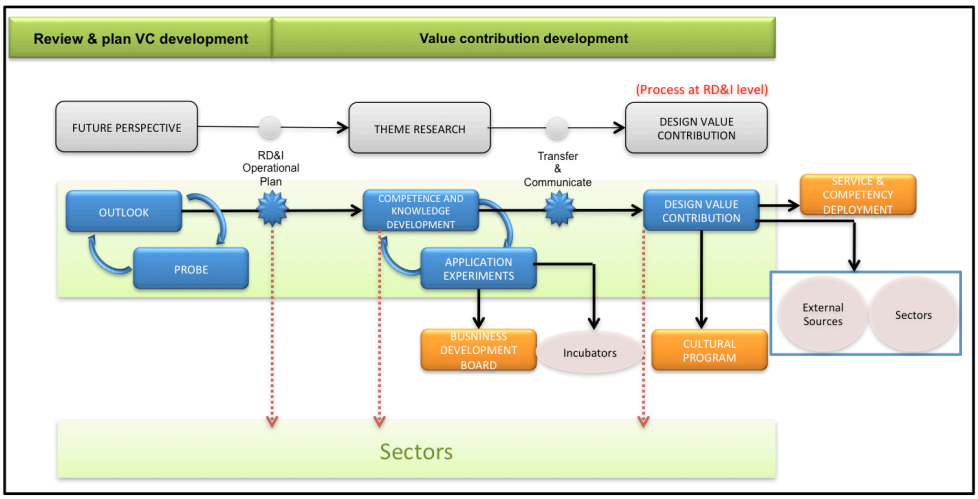

Figure 4.6: Detailed process and communication channels.

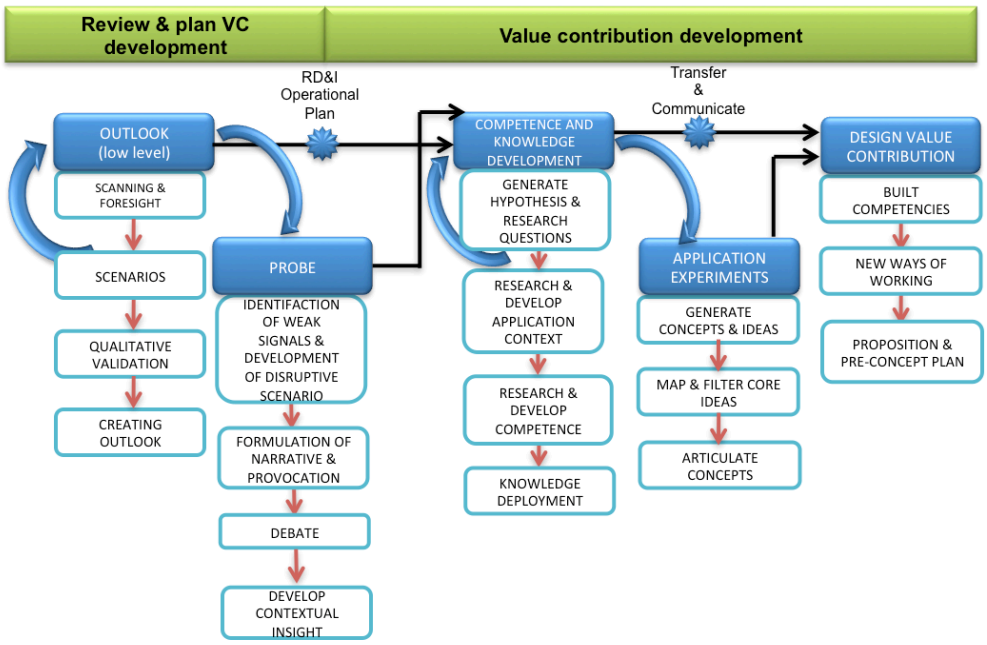

Figure 4.7: Detailed representation of the process map including the sub processes.

These stages were crucial in helping to validate the map. Stages 5 and 6 narrowed down the explanation of the variables to enable better understanding for the practitioners.

Although the technique was slightly modified to suit the needs of the business environment, the management of Philips Design had taken the responsibility to 'pilot run' the process at a practitioner level to validate it further.

4.3 Data Collection

The primary sources of data collection for the case study were one-on-one interviews, Delphi technique and participatory observation.

Participatory observation proved to be the most rewarding data collection method since I could be part of the team, while also keeping the perspective of an outsider. It was a challenge to gain the trust of the team in a short time span of nine months, being a participatory observer gave me the privilege of taking part in certain events that carved the path of the research. Interacting with the practitioners and thinkers on a one-on-one basis helped build a strong perception of what was going on. Observations made during these sessions laid the foundation for the critical foci of the research (Figure 4.8).

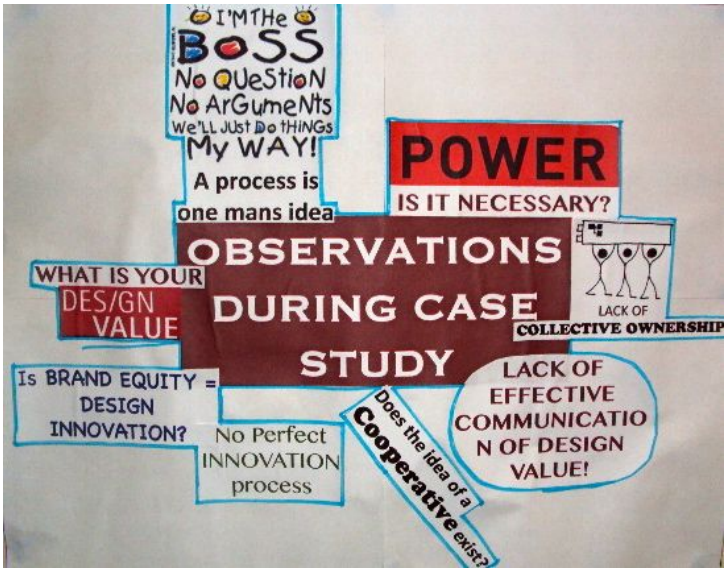

Figure 4.8: Observation during case study.

The case study used three other important primary data collection methods and these were: internal literature search conducted in stage 1, semi-structured interviews conducted in stage 2, and Delphi technique to record the process as it was happening in stages 3 and 4.

As I was part of a team, and the main goal for the case study was to conduct successful case study based research, it was important to take interviews to capture the 'human affairs' closely. As rightly elaborated by Yin (1994b, p. 171) that,

> *"The human affairs should be reported and interpreted through the eyes of specific interviewees, and well informed respondents can provide important insights into a situation".*

All the stages stated above are explained in detail in later sections.

4.4 Data Presentation

Philips Design's standardisation process is described in detail using timeline captured in excel spreadsheets and presented using flowcharts. The timeline helped

to understand the evolutionary development and milestones achieved in the last ten years by Philips Design (Figure 4.3, p.132). This provided a sense of pride to the thinkers and practitioners. The excel spreadsheet was a descriptive explanation of the innovation process; special care was taken for the choice of words for the description. This descriptive map acted as a database to document any further changes that happened to the process, and also as a training manual for the team and newcomers (Chapter 1; Section 1.3). The flowchart version of the 'design innovation process map' was used to inform and communicate the process to the wider team at Philips Design. It provided an informal description to the detailed 'design innovation process map'.

My models appeared to be of a useful format for the description. Each of the five core processes at Philips Design has sub-processes as well. There were a lot of complex decisions taken to make the map understandable by all the team members and also its stakeholders:

- There were a lot of debates between the thinkers and practitioners on the decision of selecting variables, which will be used to define the process.
- Debates followed in the process of selecting the appropriate name of the process and sub-processes and its owners.
- The biggest challenge was to make decisions on the key activities, mode of output and involvement of other stakeholders in a process.
- Each process had a number of sub-processes and each had involvement with different stakeholders, which needed to be mapped graphically.
- The process lacked a reflective practice model, which was also introduced.

4.5 Data Analysis and Validation

Structuring the case study to fit the current research required a different strategy. According to Yin (1994b, p. 13),

"The case study inquiry copes with a technically distinctive situation in which there will be many more variables of interest than data points, and as one result relies on multiple sources of evidence, with data needing to converge in a triangulating fashion, and as another result in benefits from prior development of theoretical propositions to guide data collection and analysis".

Data triangulation consists of using different methods to research the same issue with the same unit of analysis, thus crosschecking one result against another increasing the reliability of the result (Figure 4.9). Contradictory results often highlight important problems to do with design, as well as fundamental issues surrounding the understanding of the topic (Anon., , 2010). Data triangulation reduces the effect of bias. Most importantly, it inputs valuable insights to clarify issues, which would have been difficult to achieve with a single observer.

Figure 4.9: Triangulation of case study method.

To cope with the above challenge, I used triangulation to validate the information (Figure 4.8). Triangulation was used not just to fill the gaps of knowledge, but also to trigger a search for more intriguing questions (Olsen, 2004a). It helped in deepening and broadening understanding and knowledge. It also involved a combination of qualitative methodologies as a powerful solution to strengthen the

research design, as a single method can never adequately solve the problem of rival casual factors (Denzin, 1970).

The triangulation used data collected from internal literature which formed the basis of Philips Design innovation history and growth, the explicitly defined map which compiled the views of thinkers and practitioners, and the view of a third party expert (appendix 7 & 8).

The third party expert in this case study had an internal experience of the innovation process of Philips Design in the past, and also knowledge of other effective innovation processes practiced in other organisations. He was also not involved in Philips Design governance.

4.5.1 Motive of Triangulation

In the research, the motive for triangulation was to update the knowledge and data acquired during the case study. Furthermore, there are ontological grounds for using triangulation: the objects in the research were complex it was unlikely that any single observer could describe them adequately. Therefore, there was a need to be several observers/observations in different locations and/or times, so that a more complete picture could be constructed (Guion, 2002).

Altrichter et al. (2008, p. 223) contended that triangulation,

> *"Gives a more detailed and balanced picture of the situation".*

Validity in qualitative research relates to whether the findings of the study are true and certain. 'True' in the sense of your findings accurately reflecting the real situation. 'Certain' in the sense of your findings being backed by evidence (Guion, 2002). In this research, the validation of the data acquired during the case study

was very important to be judged as ‘true’ and ‘certain’, that is, they were supported by the data triangulation.

4.6 Final Outcome of the Case Study

The outcome of the Philips Design case study was given in three important parts. First was the detailed ‘design innovation process map’ in the form of an excel spreadsheet, where the process had to be captured in a descriptive manner (Chapter 1; Section 1.3). Second, was a graphical representation of the detailed map (Chapter 1; figure 1.3, 1.4; page 10), and the third, was the data analysis (figure 4.10) that laid out intriguing questions for the future of the study and identified the knowledge built by Philips that formed the platform on which the design process was built on. The third output was helpful in identifying the valuable knowledge that were building block for the Philips Design’s innovation process. Knowledge from internal Philips Design literature example 4/4-matrix (chapter 1, Section 1.3), innovation architecture (Chapter 4, section 4.6.2, figure 4.9), marketing platforms and paradigms (Chapter 4, section 4.6.2, figure 4.10) were seen to be the building blocks of the understanding f the innovation process. The theory of Design Driven Innovation by Verganti (2009) was seen as a tool for the activities of the innovation process. The analysis of the innovation process linked all theories collected at Philips Design into its practice in the innovation process and provided an explicit overview of the rational behind the existence of the process.

Put in an A3 size picture of the data analysis.

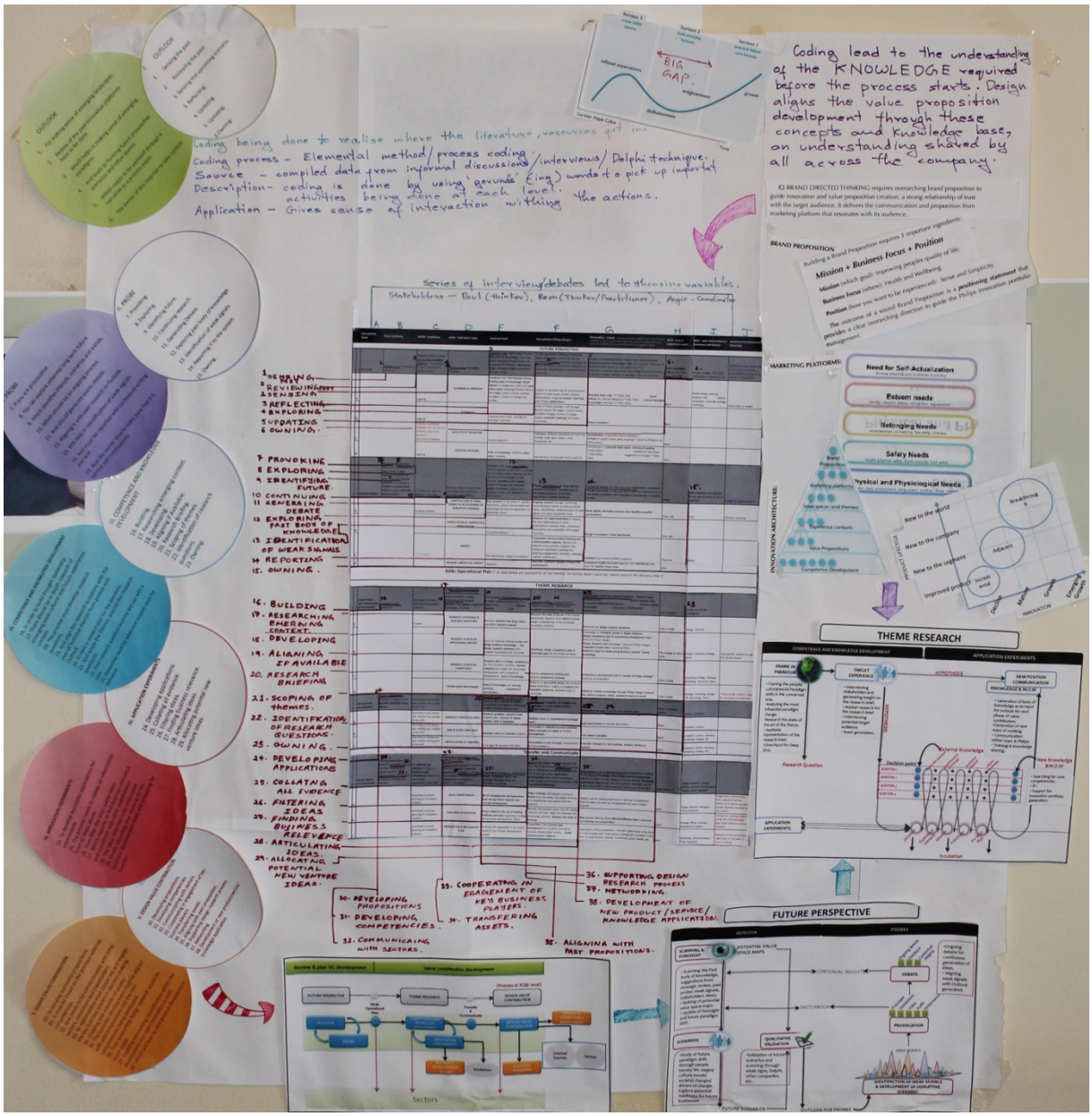

Figure 4.10: Data analysis and making sense of all collected data

The whole process was described under the variables: core process names, focus summary, timeframe, high-level/steps, required input, key activities, outputs, owner of the process and other stakeholders. The definition for each of the steps in the process was finalised in multiple meetings with respective owners for his/her process.

The second output was a graphical map that was made to ensure the process was easy to understand by stakeholder(s) and teams outside Philips Design. This set of five graphical maps highlighted the connection and communication channels, specifically with regard to inputs and outputs of knowledge.

Finally, the third output was the analysis of the innovation process map for the purpose of a deeper understanding of the knowledge on which the innovation process of Philips Design was based on. Additionally, identification of how the outcomes of the process fed back to the value development of design and the brand in the organisation (full explanation in chapter 7; section 7.1.2). Finally, the outcomes were triangulated with a third party expert for the purpose of validation of the outcomes. The triangulation drew out similarities and differences in the data collected at Philips Design data and the third party expert. The outcomes are highlighted in detail in the next section.

Apart from above, Philips Design had gained knowledge in many areas but my research highlighted the most usable and critical information for them. The research concluded in identifying the connections between the theory gathered and generated by Philips Design and the process followed by them.

4.6.1 Functional Leadership of Design at Philips Design

The most important aspect of design's role at Philips Design was its formal establishment as a function and promotion of it as a leader. In order to put design as a functional leader, Philips started a functional leadership programme aimed at aligning all the leading functions together at a strategic level. The main purpose of this functional leadership programme was to enable each of the important functions, such as technology, futures, business, design and R&D to be integrated to the corporate mission. The purpose of the study was to define functional leadership of design at Philips, based on the nature of its work at Philips Design, and enable its ownership by other corporate functions. Hence, the study concluded with a definition of functional leadership of design as:

"Functional leadership of design, is established when the corporation and functions within it, i.e.: technology, strategy, futures, and marketing, acknowledge design as one of the core entities generating value for an innovative and creative portfolio. Once design is recognised as a function, it needs an internal team who represent, and ensure, that all expected tasks align with the function of design and are utilised properly and delivered in the right direction".

At Philips Design, the function of design was involved in the 'value proposition and development programme' of Philips Corporation. This enabled design to perform one of the core processes for Philips Corporation (Figure 4.1). The core process involved the Research Development and Innovation team (RD&I) at the strategic level to develop proposals for an innovative creative portfolio for Philips. This was carried out by following the process that I had mapped.

4.6.2 Understanding the Design Process at a Corporate Level

Building a design innovation process is not easy, and Philips Design has accomplished this by developing a strong knowledge base through years of

struggle. The biggest struggle for Philips Design was to develop a system that was workable by designers and accepted by stakeholder(s) and would also increase the value of design in the organisation.

The case study at Philips Design concluded in connecting theories within Philips Design data, with the process currently being run by the practitioners. This theory used the strong background knowledge, by providing reasons for the existence of a resilient teamwork, despite the lack of an explicit process. The theory highlighted the strong knowledge base gathered by Philips Design through years of exceptional research. This knowledge that had been lost in translation, was made visible by the study. This knowledge was seen under a new light when brought forward through my research.

Philips Design claimed itself to be 'technologically driven' but the corporate policy pushes a brand driven strategy through all its functions. The involvement of design in the core processes of 'value development and proposition' for the Philips Corporation led to the 'brand' becoming a priority in the construction of its process. This is highlighted in Philips Design's Innovation Architecture (Figure 4.11) that describes the psychology behind making this decision.

Figure 4.11: Innovation Architecture at Philips Design promoting Brand Leadership (Gardien, 2008a).

The innovation architecture promotes the concept of brand leadership, not in the conventional sense of branding, but in the sense that brings out the essence of the values, of the organisation through its products, and adds meaning of 'sense and simplicity' in its customers lives. It puts design in a position to guide the corporation towards the achievement of brand leadership by connecting the company with its users. Following which, organisations form a better understanding of their positioning in the different identified marketing platforms in the lifestyle mapping (Figure 4.12).

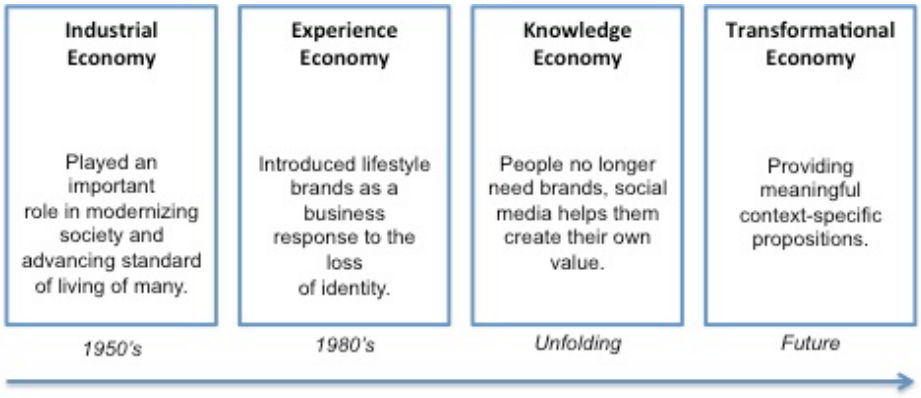

Figure 4.12: Marketing platforms/paradigms for lifestyle mapping (Brand and Rocchi, 2011).

Philips Design has developed a sound understanding of the evolution of the economy from the industrial economy to transformational economy. Brand & Rocchi (2011, p. 11) claim that Philips presently stands in the knowledge economy, where

> *"Knowledge is not just a string of information but is constructed socially, discussed and shared".*

Brand and Rocchi (2011, p. 8) further state that,

> *"These emerging paradigms in value creation have far reaching consequences for the future vitality and comprehensiveness of organisations. Many companies naturally tend to create future strategies and innovation roadmaps based only on their existing paradigm, which often does not exploit the full potential available".*

Philips Design states that companies do not have to follow these paradigms sequentially, but can leap into a new paradigm with a little effort. The study confirmed that Philips is moving through the experience economy, and Philips Design aims to leap to transformational economy in the coming decade. With the marketing paradigms recognised, Philips Design team uses the initial steps of the defined process to establish 'value spaces' (Brand, 2009b). These 'value spaces' are the themes of the future, which the company will work on. The 'design innovation process map' identifies that further experiments are conducted on these 'value spaces' to create 'experience context' for the ideas (Brand and Rocchi, 2011). The process concludes with value propositions, development of competencies, development of new ways of working, for the company and design team.

Philips Design bases its innovation thinking on a 4/4-matrix system (Figure 4.13).

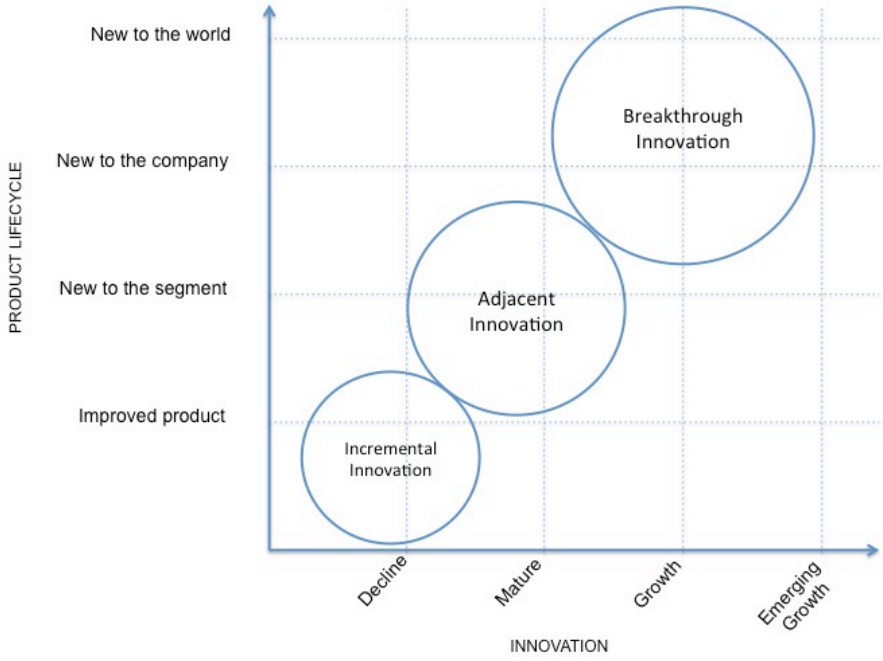

Figure 4.13: 4/4-matrix (Gardien, 2008b)

Philips Design defines its innovation structure based on the above diagram. Approximately, 65% of profit is acquired from the 'incremental innovation'. This circle of innovation is involved in bringing to market a new series of existing products with new features, details and style. This product line has a tendency to decline due to its life cycle in the market. The designers working within this circle are specialised in graphic design, illustration, product design etc. These designers are dedicated in defending the core business by innovating on existing products and services, and bringing improved products in the market at very quick intervals.

The second type of innovation is 'adjacent innovation', where most of the business development happens. This innovation is a building block between 'incremental innovation' and 'breakthrough innovation'. Adjacent innovation indulges in innovation that might be new to a particular segment or new to the company. This innovation encourages the use of other kinds of strategies like open innovation, collaboration with external players, spin-offs, and business mergers to generate new ventures and release products in the market. Designers operating in this circle

work in multidisciplinary teams, and are driven by consistent competency development and maintenance of this innovation cycle.

The third, and top most innovation, is ‘breakthrough innovation’. This innovation feeds on provocative design discourse, within, and outside the company. The most prominent step in the design process involved in this circle is ‘probes’. ‘Probe’ makes future scenarios by exploring weak signals. Unfortunately, products as a consequence of the experiments conducted by ‘probes’, have never emerged in the market. Instead, they have trickled down to be released in other suitable markets through adjacent innovation or incremental innovation (Kim and Mauborgne, 2005).

Philips Design has tried to integrate the strategic level design innovation process at all these three levels by engaging the multidisciplinary RD&I (Research Development and Innovation) team to work in the three innovation types simultaneously. In order to establish the RD&I team effectively in all the three innovation types, Philips Design spent around ten years developing competencies for the roles. Unfortunately, due to the complicated structure of the organisation and fluidity of internal innovation development, stability in this process was hard to achieve.

The innovation strategy at Philips Design is further communicated through the story of ‘horizons’ (Figure 4.14).

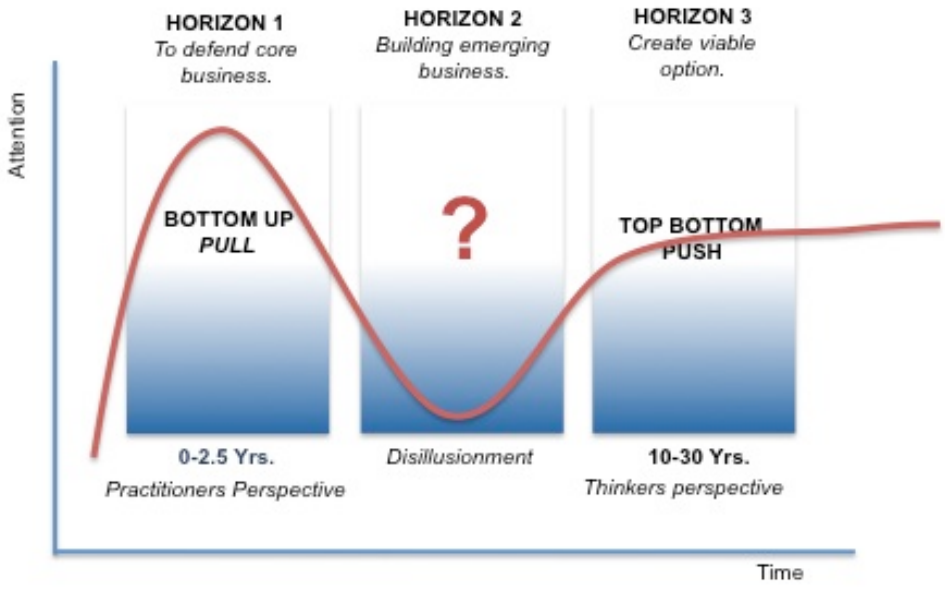

Figure 4.14: Philips context - Derived from The Alchemy of Growth (Baghai et al., 2000).

These horizons are derived from the 4/4-matrix diagram. These horizons work in three different time zones and each horizon has a dedicated set of designers. Designers working in Horizon 1 defend the core business by doing projects that have to come into the market between zero to two years; I have called this the bottom-up approach. Horizon 2 should be a comfortable path towards the future, but on the contrary, a big gap exists between the present and the future. This is due to the involvement of other stakeholders, unknown to design, and oblivious to design activities. Horizon 3 works with ideas that create viable options for the future. As the thinkers run Horizon 3, I state that it takes a top-down push approach.

These horizons are superimposed with a Gartner's Hype Cycle. This is done to study why there is a gap between the thinker's top-bottom approach, and practitioner's bottom-up approach (Figure 4.15).

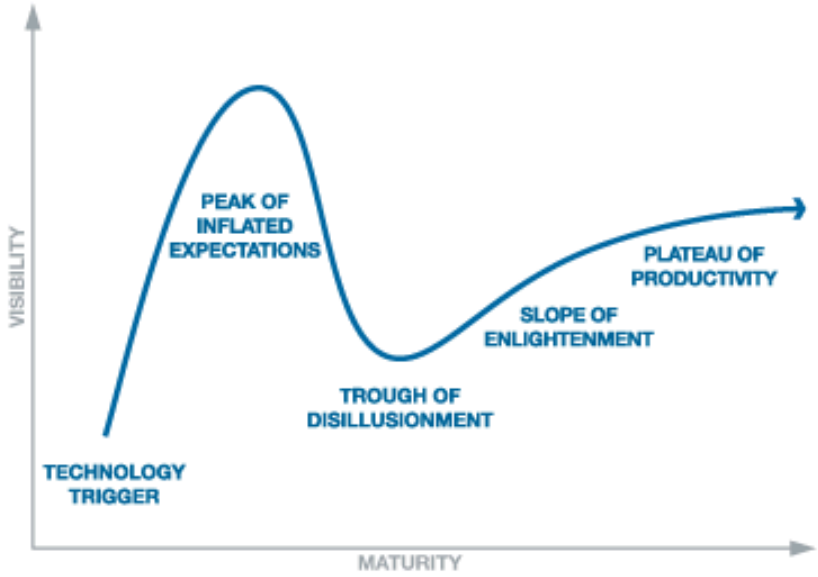

Figure 4.15: Gartner's hype cycle (Linden and Fenn, 2003)

SUMMARY

This chapter highlighted the design of the case study research conducted as a participatory observer at Philips Design. It highlights the topic of the case study with its aim to develop an effective way of mapping the complex innovation systems in a multinational organisation from a design case study perspective. The chapter provided an understanding for selecting data triangulation as one of the data analysis tools. This chapter also highlights the challenges faced during the case study and how I managed to overcome them.

With special reference to the case study research design, the chapter closes with a discussion on observations and outcomes of the case study research. It discusses the maps that were produced for the case study along with crucial discussions on the Philips aim to establish design as a functional leader.

A REVIEW OF DESIGN DRIVEN INNOVATION BY ROBERTO VERGANTI

CHAPTER FIVE: COMPARING THE THEORY OF DESIGN DRIVEN INNOVATION BY ROBERTO VERGANTI WITH ITS PRACTICE AT PHILIPS DESIGN

The previous chapter talked about, the case study with Philips Design, where I explained how implicit knowledge transfer was captured and documented in a detailed 'design process innovation map'. Once the case study was complete, I started searching for relevant literature that aligned with the practices at Philips Design and the closest alignment was found in Verganti's (2009) book 'Design Driven Innovation'. As the RD&I team was involved implementing new theories of innovation into their practice, many successful theories were integrated in their way of working. This made it very important for me to identify the closest relatable theory to Philips Design practice of innovation process. Post mapping of the innovation process an analysis was made (chapter 7, section 7.2), which confirmed that the RD&I team relates closest to the theory of Design Driven Innovation by Verganti (2009).

The gaps in the theory as against its practice at Philips Design were identified. There was found to be a reasonable difference between the theory of the book, and the practice of Design Driven Innovation at Philips Design. Nevertheless, the thinkers at Philips Design had taken the theory by Verganti (2009, p. 3-5) as an inspiration to lead an innovation process by design and develop a good communication channel and a platform for critical discussion with other functions and stakeholders. This was done keeping in mind that the design function could be promoted as a leading functional discipline at Philips Design.

Despite having the platform to make a good design innovation process based on the principles of design driven innovation, the Philips Design process lacked a strong framework. This identified the fact that the applicability of Verganti's theory was

either not being practiced in the correct way or it could not be applied in organisations like Philips. Hence, to understand the level of applicability of the theory of design driven innovation into the practice of Philips innovation process, the current chapter talks about similarities and differences between, this theory and, its practice. Additionally, it identifies the gaps in the practice and later, contributes to knowledge by providing suggestions that could fill the gap and make the theory applicable to multinational organisations such as Philips.

5.1 Something About The Author and His Idea of Design and Management

> *"These firms take a broader perspective by investigating the evolution of culture, society and technologies, and make proposals putting forward a vision about possible new product meanings that people are not solicited but that they were eventually just waiting for" (Verganti, 2009).*

Verganti is a professor of innovation at Politecnico di Milano, the founder of project science, a consulting institute that advises global corporations on the management of strategic innovation, author of many influential articles on innovation in leading management and scientific journals. He has accomplished sound theoretical knowledge based on field studies in a number of design intensive Italian small and medium enterprises. The book provides a provocative view of innovation thinking and practice. Verganti (2009) does not call it a book about design or creativity or scrutinizing customers but a theory of management, which teaches how organisations can manage innovations that customers do not expect but eventually love.

He talks about managers having their own personal culture, a vision of evolution of the context of life, in which their products and services will be used. Every person builds their own culture by their interaction in the society, social explorations, experiments and relationships in both private and corporate settings and there is no need to be an expert in extracting value out of it. Every human being has a concept of culture and has the ability to personify. Additionally, Verganti (2009, p. 4) believes that, management theory does not help in unleashing this talent in managers. He also states that a designer's role has been minimized to two stereotypes, but very important aspects of practice; one the role of a stylist and second the role of user-centred designer. He states,

> *"First styling and then user-centred design have been portrayed as vehicles by which companies differentiate themselves from the competition".*

Verganti (2009) believes that designers just like managers have their own culture but due to the above two specific role definitions, designers seem to follow a pattern where they value methods more than the intrinsic designer's culture. The author does not challenge the role of styling and user-centred design, as he states those strategies are important for incremental innovation in an organisation. According to him, different skills and attitudes are required to accomplish breakthrough innovation.

5.1.1 The Strategy of Design Driven Innovation

> *"Can design save the world? No, but it can definitely help make it better, especially if integrated within the systems that already have direct impact on the economy and on policy-making. Verganti belongs to a small group of enthusiastic experts and interpreters that have set out to explain the culture of design to the powerful but unaware, so that they*

can appreciate its full potential" - Paola Antonelli, Senior Curator, Architecture, and Design The Museum of Modern Art, New York.

Presently, innovation focuses on two strategies; the first is quantum leaps in product performance enabled by breakthrough technologies that relies on the domain of radical innovation pushed by technology, and second is improved product solutions enabled by better analysis of users' needs in the domain of incremental innovation pulled by markets (Figure 5.1). The third strategy that could be used that of Design Driven Innovation, the radical innovation of meaning.

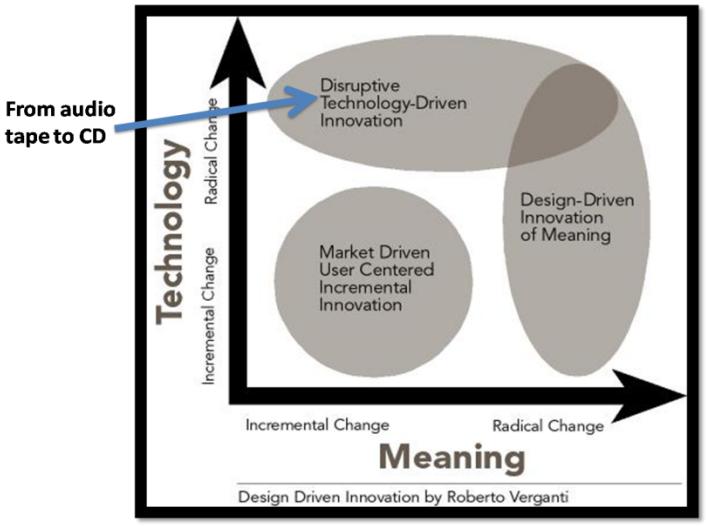

Figure 5.1: Strategy of Design Driven Innovation (Source: (Verganti, 2009)).

Companies participating in Design Driven Innovation are making proposals, and putting forward a vision, hence making this strategy a push strategy. Verganti (2009) believes that these visions are not dreams without foundations but are capable of being translated into products and services. In addition to the above, Design Driven Innovation strategy bases itself on two important findings in Verganti's study of design intensive small and medium enterprises. The first is, long-term competitive advantage is fed by radical innovation, and is very risky. For many the phrase radical innovation focuses on the effect of technologies on

organisations. The second finding is that, people do not just buy products as material, but they buy meanings, and firms should look beyond features, functions, and performance to understand the real meanings users give to things.

Theorists alike Kessler & Chakrabarti (2010) see design as a differentiator; the last weapon firms can use to make their products look different from that of their competitors. Whereas, Verganti (2009) promotes design as a strong management strategy and not just a tool. Verganti (2009) puts it in context when he states that,

> *"Design driven innovation is not about being creative. Rather, it is about setting a direction and investing in rational assets".*

Rightly commented upon by San Francisco book review (2009, p. 14) that,

> *"If you follow Mr. Verganti's advice, it may take a while, but your competition will be left wondering how it was you managed to redefine experience (and capture) their business".*

5.1.2 The Process of Design Driven Innovation

> *"Innovation allows the success of any activity. This is particularly true for business and, even more so, in the challenging times we are living in. This passionate and accurate study will offer valuable information and a fundamental reference for all those interested in design and determined to pursue innovation as a driving factor in their profession"- Luca di Montezemolo, Chairman FIAT and Ferrari (Verganti, 2009, p. 55).*

Firms practicing Design Driven Innovation step away from users to take a broader perspective. These are series of researches carried out in socio-cultural terms and based on how people evolve. These firms try to envision how the context of life could change for the better. When companies start asking these questions they realise they are not alone and every firm has collaborators, partners, suppliers asking the same questions and looking at the same people in similar life contexts. These people are called, interpreters, who are researching, how they can give meaning to things, a very important ingredient for Design Driven Innovation (Figure 5.2). Hence, Design Driven Innovation calls for firms to come close to interpreters, who influence how people could give meaning to things.

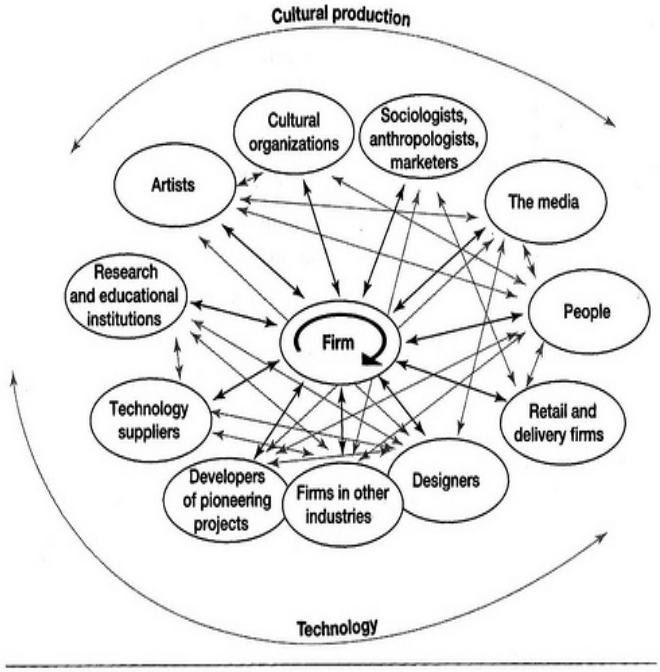

Figure 5.2: Interpreter's in a collective research laboratory (Source: (Verganti, 2009)).

Design Driven Innovation (2009) outlines the process led by a firm's strategic level executives for leveraging relationships with interpreters, into radical new meanings for products. Interpreters as described by Verganti (2009) are,

"These maybe artists cultural organisations, sociologists, anthropologists, marketers, and the media, who make the exploration of culture and meaning an explicit component of their core mission".

These interpreters do this through:

Listening - Identify and attract key interpreters and access their knowledge about possible new meanings.

Interpreting - Develop unique proposals based on this knowledge.

Addressing – Use the seductive power of interpreters to sway customers' minds and hearts.

It is difficult to identify codified steps to carry out Design Driven Innovation. It is interwoven into rational assets, with a network of key interpreters. It is very important to note that Design Driven Innovation is a gateway for strategic open innovation and collaboration to enable these networks.

Developing relationships with interpreters is the first, but not the only sufficient move by firms to achieve a complete Design Driven Innovation. This action is important as it allows companies to gain knowledge and interpretations. This knowledge must then be translated into the organisation's own vision and proposal through a process of internal research and experiments. Few firms take an unstructured approach, while some take structured approaches dependent on their resources. Larger companies need to structure their process and create a sequence of workshops, interactions with interpreters, and experiments that lead towards Design Driven Innovation. One of the processes that envisaged Design Driven Innovation was done by Barilla (Figure 5.3).

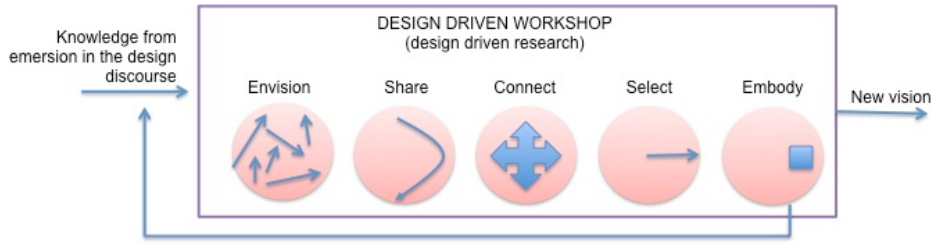

Figure 5.3: Process of design driven innovation used at Barilla (Source: (Verganti, 2009)).

The activities involved in this process are:

- **Envision** – The first activity involves a design directed workshop, producing insights. This workshop sees the interpreter's research being questioned and its implication discussed.
- **Share** – This activity involves sharing insights with a larger team. The aim is to compare, discuss, and bring together ideas from the previous activity, and make them richer through more modifications, and interpretations.
- **Connects** – This activity entails building probable design scenarios, and finding connections between proposals.
- **Select** – There can be many bases for selecting a proposal. The most used are based on scorecards, on variables namely, utilitarian value, functionality, communication/language and sensation/memory/imagery.

Where Design Driven Innovation is considered, designers play a very important role at an organisation's inception, especially when an organisation's breakthrough in technological innovation happens. The breakthrough technology embeds many potential meanings, but only immediate meanings are received in the early stages. Other meanings are 'quiescent', but sooner or later they become manifested (Figure 5.4).

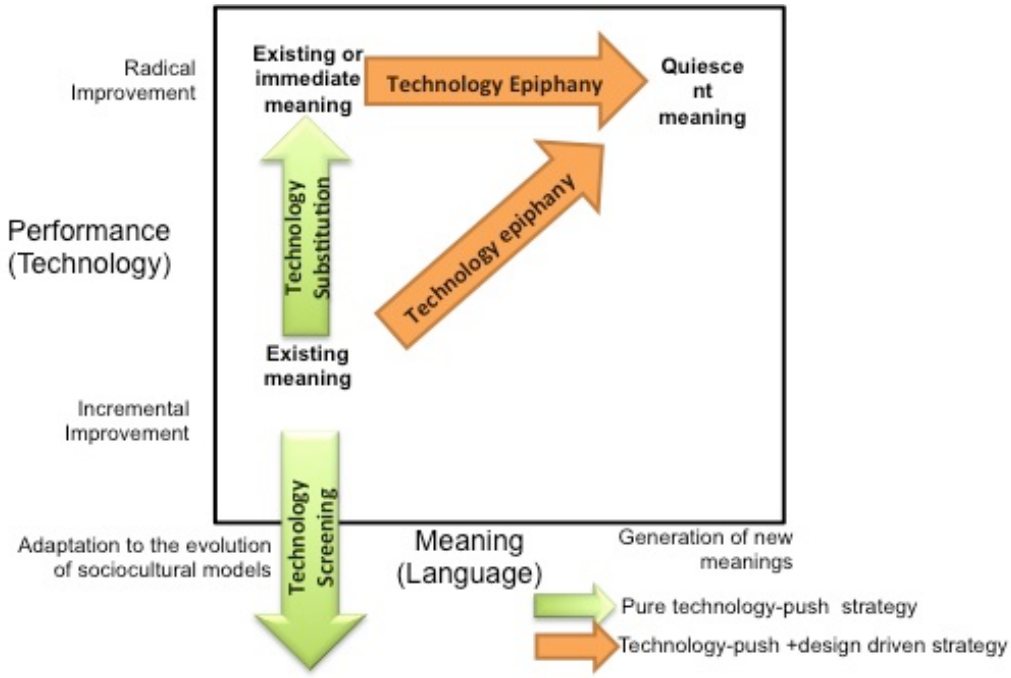

Figure 5.4: Comparison of strategies (Verganti, 2009).

5.1.3 Building Design Driven Capabilities

Design Driven Innovation requires an organisation to develop distinctive, proprietary capabilities regardless of the size. Three capabilities are indispensable for successful Design Driven Innovation;

- Relational assets with key interpreters,
- Internal assets supporting the organisation's knowledge and seductive power,
- The interpretation process.

5.1.4 Value of Design Driven Innovation

Literature states that an organisation's innovation is connected in four ways to its economics, profits, assets, investments and shareholders. Design Driven Innovation itself has significant implications on all these factors:

- **Profits** – Design Driven Innovation leads to unique products and may act as a major source of profit. Products created with their strong and unique

personalities are more appealing to people. People are ready to pay more for products that are meaningful.

- **Corporate Assets** – Design Driven Innovation contributes to brand equity. Brand value is generated in many ways by firms today, through advertisements, quality, customer satisfaction, technological innovation, but radical innovation of meaning is the most powerful aspect. This is because, product meanings, and languages determine user experience, and therefore have a direct impact on an organisation's brand. In addition to the above contribution to an organisation's assets, it enables organisations to construct the rules of the game, and gain advancement against their competitors. Bringing a new product with a new meaning to users enables the organisation to create new archetypes, which are very difficult to imitate. The contribution of Design Driven Innovation in corporate assets concerns knowledge. The organisation is the first to invest and hence, it is the first to learn, enabling it to drive better results in incremental innovation, streaming out from breakthrough innovations. Lastly, a organisation moving first in creating products of meanings is able to attract more key interpreters and create collaborative networks with them.
- **Investments** – Design Driven Innovation has an investment cost, but the investment cannot be determined as it varies. Big corporations who have a vast network of collaborators can use this strategy of networking, finding, and working with key interpreters to cut down cost. The same is a bit difficult for smaller organisations.

5.2 Comparative Analysis

For current research, I did a comparative analysis between, theory proposed in the book and Design Driven Innovation practised at Philips Design and found important correlations and differences. This enabled me to spot the contribution to

knowledge, in the field of Design Driven Innovation and the anticipated addition of value of my work to the body of knowledge.

The analysis led me to make an initial table (table 5.1). These differences underwent further changes as the research was carried out further.

Design Driven Innovation Theory	**Design Driven Innovation Practice (Philips Design)**
Bases itself on radical change of meaning with Technology push.	Is influenced by market pull (user centred) approach largely.
The process uses 'interpreters', the firm itself, and an envisioned context of life represented and a person.	'User' still plays an important role.
Design is a function with decision-making powers.	Design shares its decision-making powers with other important functions and stakeholders.
Design's role is defined.	Design plays various roles within the organisation and not just related to product development.

Table 5.1: Differences in Design Driven Innovation practice and theory.

The memo will be elaborated further in detail in Chapter 7.

5.2.1 Comparison of Theory of Design Driven Innovation With its Practice at Philips Design

The research has identified four gaps in the theory and practice of Design Driven Innovation. The first is seen in the role of interpreters. Philips Design incorporates the techniques used by interpreters as stated by the theory in its own innovation process at a strategic level (Figure 5.5). Philips Design does it in three phases. First, is the act of interpreters where they step back from users to get a broader

perspective is done by the first phase of the innovation process at Philips Design, called future perspective. Second, the act of interpreters to build scenarios is done by the second phase of the innovation process, called theme research. Third, the act of modifying context is partially done by the third phase of the innovation process, called design value contribution. The third phase of the innovation process is further involved in developing competence and new ways of working that helps in the next cycle of the process.

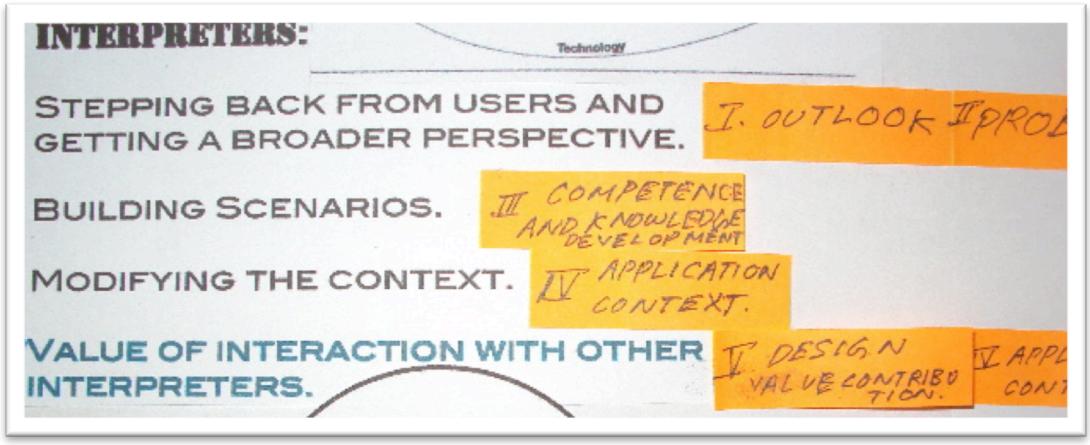

Figure 5.5: Similarities in process.

The theory has been applied in constructing the interaction between different interpreters[48] within the organisation. Collaboration with external interpreters happen in the third part of the innovation process which involves itself in pre-seeding concepts into the market. Unfortunately, the aim to make proposals based on radical innovation of meanings of products has not yet been realised at Philips. In practice, Philips rolls out breakthrough ideas within the adjacent innovation cycle/H2, which involves products that are new to the company but not new to the market. Additionally, in Verganti's definition designers and other occupational groups called interpreters, have defined roles in the innovation process, but in practice these decisions are surrounded with ambiguity. At Philips Design the team

[48] Interpreters – In practice Philips Design regards internal stakeholders as its main interpreters. The RD&I innovation process involves stakeholders from other functions in the organisation involved in socio-cultural and trend research in envisioning future scenarios.

members involved in radical innovation of meaning have to share responsibility, and work on multiple projects at different levels of the innovation platform, which are not necessarily, radical in nature. Despite the interpreter's role being partially defined the process at Philips Design falls short in maintaining strong communication structure between the different interpreters and strong decision-making leading to loss of ideas and waste of time.

There is a need for further support from the theory of Design Driven Innovation in respect to the role of interpreters applicable in different organisational structures, under different leadership styles, and under influence of different corporate cultures. For example, the most obvious inclusion of Deign Driven Innovation at Philips Design Innovation process comes from alignments between theory of Design Driven Innovation and theories of Functional Leadership. And the study of this relationship has been stressed upon in further research as well.

The second gap is the balancing of breakthrough ideas with other mainstream incremental innovations including Design Driven strategy for spin-offs, collaborations and failures. Philips Design faces a challenge, where it has to balance its innovation with different segments, business units and layers of organisational structure. In theory Verganti (2009) talks about how organisations achieve radical innovation of meaning through Design Driven Innovation, but he does not give organisations ways to spread their innovation strategy to provide to different markets using Design Driven Innovation strategy.

The third identified gap is the alignment of Design Driven Innovation with user-centered approach. The use of a user-centred approach at Philips Design is inevitable as it is an important part of the strategy used by marketing. Marketing function is an important stakeholder in the innovation process run by the RD&I. User-centred innovation is at the core of their innovation process, and feeds into

the Design Driven Innovation process followed at the strategic level at Philips Design. On the contrary Verganti (2009) states,

"Want to be radical, forget user-centred design innovation".

In practice, Verganti's claim will be difficult to implement in many corporate environments, as most will still be using user-centered research as a tool in their innovation strategy.

And forth gap is the lack of quantifiable value added by design through its value addition in organisation. Verganti (2009) states the importance for value of Design Driven Innovation, and explains how it can improve the organisation's knowledge assets, tacit assets, profits, and stakeholder relation and also reduce investments. In reality design driven innovation teams have to fight their way through all the challenges to get access to companies' assets and hardly get a chance to exploit their imagination and talent. It takes visionary leaders to make a process like Design Driven Innovation a success. In practice, the capabilities include, competencies that need to be developed for the innovative team to function in collaboration with the larger team, and other functions. These capabilities have to take into account ego, politics, budgets and power within the organisation. At this point Verganti (2009) does not get into the discussion of these challenges posed towards design and further research is required to get to the depth of these issues.

Keeping in mind the above discussion, the study has set out, to make a contribution to knowledge, by working through the differences between theory and practice of Design Driven Innovation. In the end, it sets about making distinctive claims that solve the differences and give insights, to solve the implications of implementing Design Driven Innovation in organisations like Philips Design. The details of which will be talked about in chapter 9.

SUMMARY

The chapter introduced the key elements of the theory of Design Driven Innovation by Verganti (2009) by highlighting the strategy behind design driven innovation that is radical innovation of meaning. It describes how Verganti (ibid) promotes design as a strong management strategy rather than a tool for product differentiation and customer-centric innovation. The chapter goes on to highlight the aspect of theory that are relevant to the practice of Design Driven Innovation at Philips Design, like the role of interpreters and translation of value of Design Driven Innovation into organisational profits, investments and assets.

The chapter ends with a comparison of Design Driven Innovation theory to its practice at Philips Design by providing a detailed account of gaps in the theory. It stated that the theory has gaps to fill in four important areas. The first is the role of interpreters with respect to the organisational structure, type of leadership and internal organisation culture. Second, is the balance of breakthrough ideas with other mainstream incremental innovations including Design Driven strategy for spin offs, collaborations and failures. Third, is the alignment of Design Driven Innovation with user-centred approach, which continues to be practiced in organisation by its important stakeholders. And forth, is the lack of quantifiable value added by design through its value addition in organisation.

EXPLORING OTHER ORGANISATIONS

CHAPTER SIX: EXPLORING OTHER ORGANISATIONS

The research established early on the need to explore other organisations in order to establish better knowledge and a robust research design. This exploration provided a broader vision and understanding in terms of research content and helped with data interpretation.

This chapter provides reasons for choosing and exploring other organisations. Then goes about providing narrative for each of them. These narratives have been compiled from one-on-one interviews, conference proceedings that I attended and other relevant secondary resource materials. Due to confidentiality agreement the organisations have been anonymised.

6.1 Exploring other Multinational Organisations

The idea of exploring other organisations was first considered important during the Philips Design case study. Taking the opinion of other organisations helped in understanding why a multinational organisation like Philips Design has problems with positioning design in its corporate strategy. Exploring the role that design plays in other multinational organisations provided an opportunity to triangulate my understanding of the role design could play in an organisation generally.

6.1.1 Reason for the Exploration

Once I validated the data collected at Philips Design, I needed to explore other organisations to compare the information with the data from the case study. As data triangulation was being used as a validation method, other sources of data were important to prove its accuracy and validity (Guion, 2002). Triangulation of data with other organisations provided a better understanding of organisational design practice. Additionally, exploration of other organisations provided me with an

opportunity to get first hand information on the practicality of complex innovation systems in big organisations and the role that design could play.

I also wanted to interview individuals involved in taking important strategic innovation decisions in big organisations. The opinions of these corporate staff members on design and design activities concerning their organisation's innovation strategy were expected to provide my research insights and raise other important questions for the research.

6.1.2 Criteria for Choosing the Organisations

The selection of the organisations depended on a lot of factors, specially the availability of the desired employees and their valuable time. During the course of the study the criteria of selecting these organisations changed due to non-availability of information and ethical considerations. The inspiration for making the criteria for selecting three other organisations for the exploration purpose of the research was taken from the 'golden circles' of Sinek (2012) (Section 1.8.2, Figure 1.11).

The circles provided a model that codifies three distinct and interdependent elements: why, how and what that makes any person or organisation function at its highest ability. All three-selected organisation were explored in detail by interviewing their vice presidents and design leaders. In addition to the interview, Company A, Company B, and Company C provided other resources of data like conference presentation and internal company related literature.

Philips Design bases its philosophy on the constant exploration of the changes taking place in behaviour and socio-cultural aspects in the society. Basing their study on these changes they wanted to co-create and develop an ultimate link between academia, research and industrial practice (Proctor, 2013). Philips Design

and other recognised functions work on the process by following a functional leadership programme, which aims to generate a creative portfolio for the organisation. All these goals are achieved with design as one of its important functions working side by side with strategy, futures, technology and business.

The criteria stated for Company A were very similar to that of Philips Design. Company A's philosophy aimed at connecting people by generating a creative profile by involving design at the strategic level. Although design was not given the status of a functional leader, it was given the status of an inspiration provider to the organisation. Company A similar to Philips Design believed in the power of the people and multidisciplinary teams. Being technologically driven Company A could not depend solely on design.

The philosophy of Company B's strategic innovative thinking was also seen to be similar to Philips Design. Where Philips Design was focusing on future explorations of behavioural and socio cultural aspect of society, Company B was researching future demographic and physiographic changes to construct a portfolio of opportunities. Like Philips, Company B was seen involved in health and wellbeing of the travellers and they used technological innovation to make safe and ecological products. Design at Company B plays the role of a support function and not of a leader and this provided an opportunity to understand the reason behind this decision.

Company C concentrates on the wellbeing and comfort of its customers. Unlike Philips Design it extensively involves a customer research approach to generate ideas. The similarity between Philips Design and Company C was in the methods used to explore the ideas with creative research for future idea generation. Design at Company C played the role of a support function and provided an opportunity to question the future of design in a heavy engineers and technologically driven organisation.

In the section below I will provide a narrative about the strategic innovation process being followed at the organisation and the use of design and the problems and solutions attached to its policies. To make the process easier to understand I have divided the information into 5 separate sections, the:

- Role of Design
- Problems attached with the role of design being carried out satisfactorily.
- Probable solutions that have been tried by the strategic team.
- Challenges to adhere to these solutions.
- Achievements beyond the challenges.
- Other information on strategic innovation of the organisation.

6.2 Narrative

The following section will state the narrative for Company A, Company B and Company C.

6.2.1 Company A

6.2.1a Role of Design

The corporate structure of Company A integrates design laterally to its development platforms, as seen in Figure 6.1. Design superimposes itself on the platforms of mobile phones like smart devices, location & commerce and markets and works in line with the chief technology officer. Other functions play an important part but are more like a support function at Company A. Design being a very important part of the innovation strategy at Company A and takes the executive role by reporting directly to the CTO (Chief Technology officer).

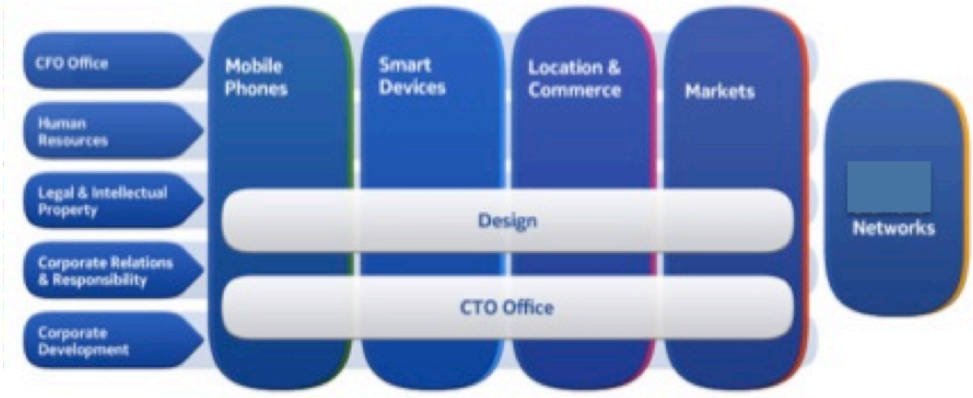

Figure 6.1: Corporate structure at Company A (Source: (Anon., , 2006b)).

Company A Research Centre holds the design research team, which works as an inspiration for the organisation showing future perspective for new business development, or new market acquisitions along with innovations in digital media, human interaction, interface design and the application of new technologies (2006a).

6.2.1b Problems Attached with the Role of Design being Carried Out Satisfactorily

Company A believes in the power of self-motivated, inspired people, the role of a design leader as a facilitator and not of that with an absolute authority (Appendix 9; Question 2,3). Authority in Company A is not described as a necessary ingredient for design leadership. It is the act of pulling and connecting the right people and skills for the right job at the right time that makes a good design leader (Appendix 9; Question 2). Former head of design at Company A compares the role of a design leader with the coach of a football team whose duty is to detect the skill of his team players and put them in the right position on the field.

A problem related to the role of design in the eyes of Company A is the business model and its reporting structure. In Company A, the design head reports to the CTO (Chief Technology Officer). Design is integrated with other functions of the organisation through their communication channels. Despite design being

integrated well within other functions of the organisation, it is given less privilege to play with the assets of the organisation.

6.2.1c Solution to the Above Given Problems

At Company A, the role of design as a functional lead and inspiration provider to the organisation has a few problems. Former head of design at Company A thinks that there are certain solutions to these problems. One of the solutions is to have a good team with inspiring and intelligent people. On the other hand just having a team is not enough, a team needs fixed roles that each individual plays to accomplish a well-defined goal. He agrees (Appendix 9; Question 3) that this is not easy to accomplish and states that,

> *"the mission and vision of the company is well defined and everybody knows their roles and acts with responsibility."*

6.2.1d Challenges to the Solutions

The biggest challenge to implement the solutions provided above is related to issues of integration of design research with Company A's Research Centre headed by technology. Company A's Research Centre integrates all the corporate functions and the CTO (Chief Technology Officer) by working very closely together. Until 2010 design's role in Company A's Research Centre was to have a stakeholder and source of inspiration to the organisation.

Unfortunately, designs influence on Company A's Research Centre is not strong as there is a lack of supportive culture causing a lack of positive and creative exploration by design.

6.2.1e Achievements

The design team at Company A has been trying to push and show new future perspectives for growth by being an integral part of the strategic level decision

making. Design team at Company A have been successful in aligning innovation thinking laterally and has enabled design to influence business decisions at all levels.

For detailed questionnaire please refer to appendix 9.

6.2.2 Company B

6.2.2a Role of Design

Company B does not make consumer goods and is solely dependant on technological innovations. The Vice President of Cabin Innovation at Company B claims design's role in the organisation cannot be of a leader but it is of importance. He (Appendix 10; Question 1) states,

> *"It does use consumer insights to translate into good design and valuable options for its target customers. But it's difficult for a heavy industrial good company to depend only on designer's."*

Company B has a design studio lead by a multidisciplinary team that incorporates designers and is headed by technology (Appendix 10; Question 2).

6.2.2b Problems Attached with the Role of Design Being Carried Out Satisfactorily

An organisation based in Germany, Company B has a well-structured business model with well-defined functions and roles for its stakeholders. Nevertheless, Vice President of Cabin Innovation at Company B (Appendix 10; Question 3) states that,

> *"It's a complicated company with a lot of stakeholders and one mistake can cost massive amount of losses. So yeah one of the necessities is to make sure everyone in the team is on the same page and the way of working has been in*

the induction process of new comers. It's a company policy to introduce them to the systems and protocols."

As stated before, Company B depends on technological innovation and finds it difficult to give design a role of a leader but encourages design's value contribution as a support function. Design plays an important role in the decision making process but under the vigil of the technology expert. At Company B, designer's lack in undertaking leadership roles, as they do not have the right skills to lead an organisation. As stated by Vice President of Cabin Innovation,

"We had one [design leader] but it did not work out. The person could not lead the team."

6.2.2c Solution to the Above Given Problems

In Company B, designers help and coordinate with other disciplines at different levels of decision-making. Design is a part of the multidisciplinary team who are involved in creating the innovation portfolio for cabin design. Figure 6.2 iterates the four areas of that influence cabin innovation within the Company that was derived through the collaborative discussion within the team involving design as well. The process of cabin design innovation bases its decisions on consumer interaction, marketing explorations, innovations in existing business models and on collaborators and competitors. The process is also influenced by market trends, socio and cultural changes explored by an internal research team, new business requirements arising due to rapid market changes and the need to be sustainable.

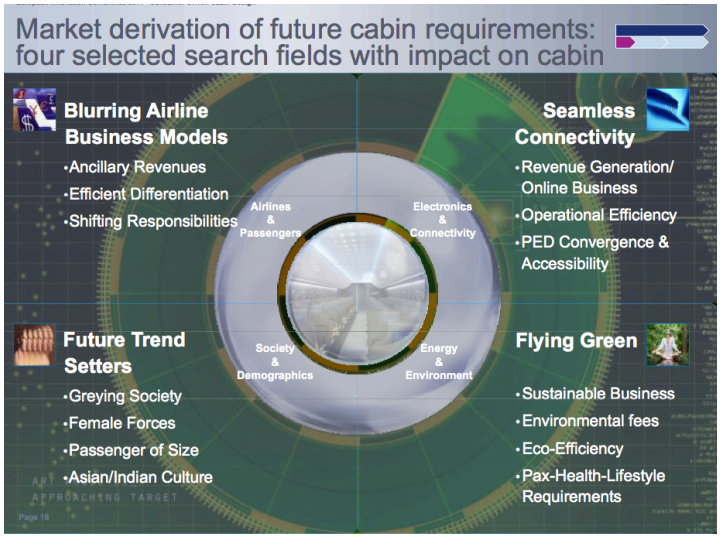

Figure 6.2: Company B Innovation development themes (Source: (Wuggetzer, 2011)).

Company B has compulsory human resource training for all new entrants and existing employees. These trainings aim at preparing the employees with the new internal innovation decisions, trends and engaging them with the rules, and policies of the team as well as the organisation. The induction process is very important to avoid losses and mistakes. Additionally, to encourage employee involvement in the idea generation process the organisation the organisation offers incentives to employees for idea generation and internal collaborations and facilitates teamwork.

6.2.2d Challenges to the Solutions

Company B has tried to create a collaborative environment to facilitate successful work culture through training its employees, identifying roles for its stakeholders, creating rules and a fixed process that helped in identifying themes for the future portfolio for cabin design.

Despite their success in creating a multidisciplinary team that work together to think about the future growth areas in cabin design innovation, they are struck with a greater challenge. This challenge is in trying to run two different innovation cycles parallel i.e., aircraft innovation process and cabin innovation process (Figure 6.3). The innovation life cycle of an aircraft design starts every 10 years and the

innovation cycle of the cabin design starts every 3 years. Hence, the resources and capital required for both the processes are different.

Figure 6.3: Parallel running Innovation processes (Source: (Wuggetzer, 2011)).

For Company B, the innovation process starts with a new technological development or a breakthrough and moves towards the development of an idea, which may or may not get incorporated in the final product. Finally, for an idea on aircraft innovation to be accepted by clients, Company B has to make the idea go through a number of checks, policy runs and discussions. As when it makes as a final product it stays for 10 years. On the other hand, a cabin innovation comes from a push from a market gap/need or requirement, which is then considered by the stakeholder and if agreed upon is developed for the existing models with the right kind of technology.

6.2.2e Achievements

Design has been incorporated in Company B's customer centric approach. And through design the organisation has identified three broad customer needs; the passengers who are driven by comfort and services, the airlines who are driven by efficiency and stakeholders within Company B who are driven by productivity.

These consumer needs form the basis of their future trend research as well as feeding into the process of innovation at all levels in the organisation (Figure 6.4).

Company B claims that a consumer centric approach is the best way to capture the future trends in design, innovation, technology and socio cultural aspects and helps them think about future design and innovations. Company B has developed a process that proposes products keeping its three primary stakeholders in mind and helps in focused innovation (Figure 6.5).

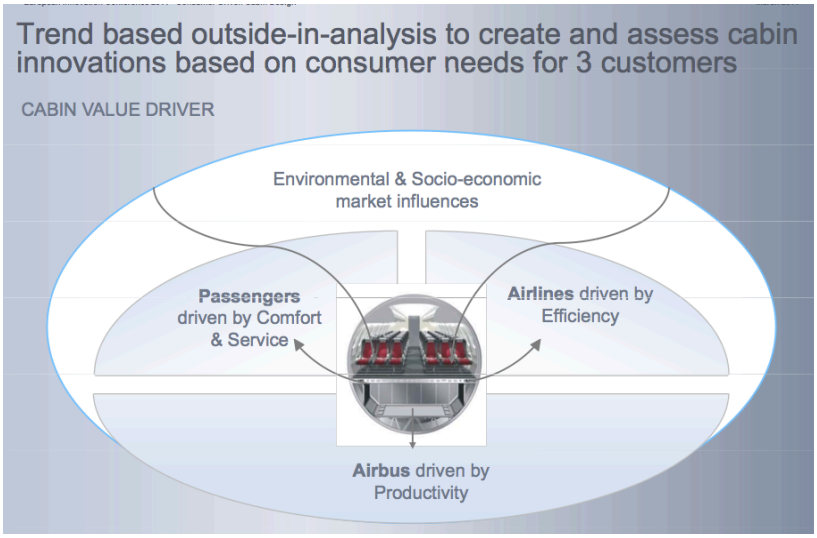

Figure 6.4: Three kinds of customer focus (Source:(Wuggetzer, 2011)).

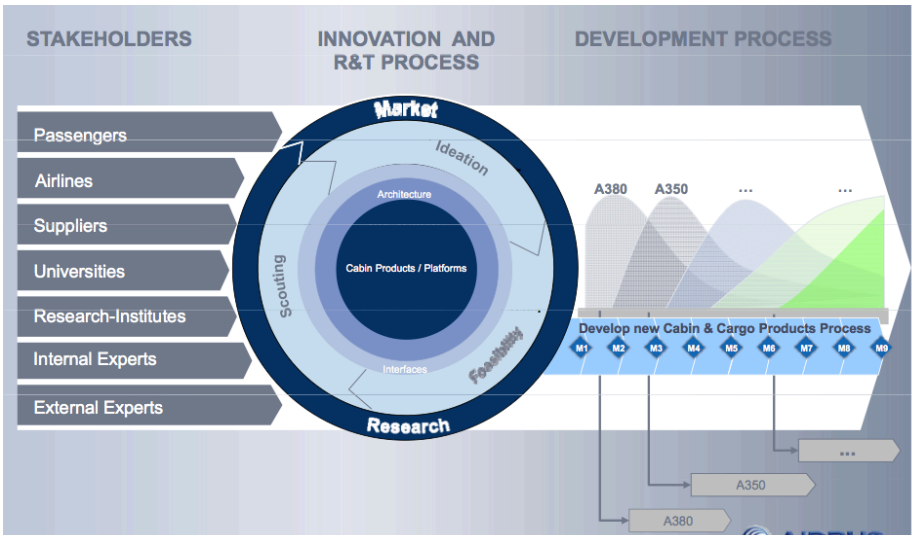

Figure 6.5: Stakeholder & development process (Source:(Wuggetzer, 2011)).

For detailed questionnaire please refer to appendix 10.

6.2.3 Company C

6.2.3a Role of Design

In Company C, design's role is important in providing visual identity to the products so that the consumer could directly link the products to the brand (Appendix 11; Question 1). Design is not a driver of innovation but plays an important part in the customer research centre. For Company C, design is a way to make all their products visually belong to the same gene pool[49]. Head of customer service and innovation at Company C states (Appendix 11; Question 1) that,

> *"[Design] helps in communicating the image of the brand strongly to the customer."*

Company C has a strict policy of branding where they standardise their communication by making all stakeholders follow basic rules in the layout of brochures to create a consistent, clear and appealing brand design. Company C uses design to manage numerous different media and maintain a synergy through its products and communications. The organisation manages customer research in its exclusive consumer research centre along with a 'heterogeneous team' including designers from different backgrounds (Figure 6.6). Keeping brand as the priority, Company C provides Brand & Design Navigator support to all its employees, suppliers, collaborators to maintain the visual identity of the brand and they call it the 'Company C's Corporate Design' (Renner, 2011).

[49] Gene pool – The concept of gene pool come from the department of biology that indicates genetic diversity is a population. In design context, it is used to signify the element of similarity provided by designers in styling the product appearance so that they all represent one brand. See: Southgate, P. (1994) *Total branding by design: How to make your brands packaging more effective,* London, Kogan Page.

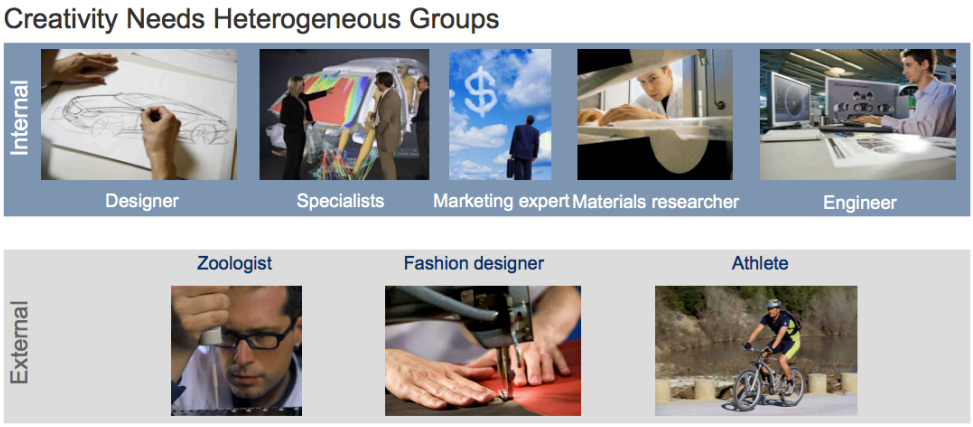

Figure 6.6: Heterogeneous team (Source:(Renner, 2011)).

6.2.3b Problems Attached with the Role of Design Being Carried Out Satisfactorily

All new ideas have to go through four stages before it makes it to the innovation funnel at Company C. These stages are; first the idea must fit the brand, second it must fit to the consumer, third it must have a balanced evaluation & cost analysis and finally it must have the approval of the management board. Although these stages are helpful in identifying strong ideas, it does not help design get in a leadership position. The corporate culture believes in rules and has fixed ways of pursuing an idea into the organisation's innovation funnel (Figure 6.7).

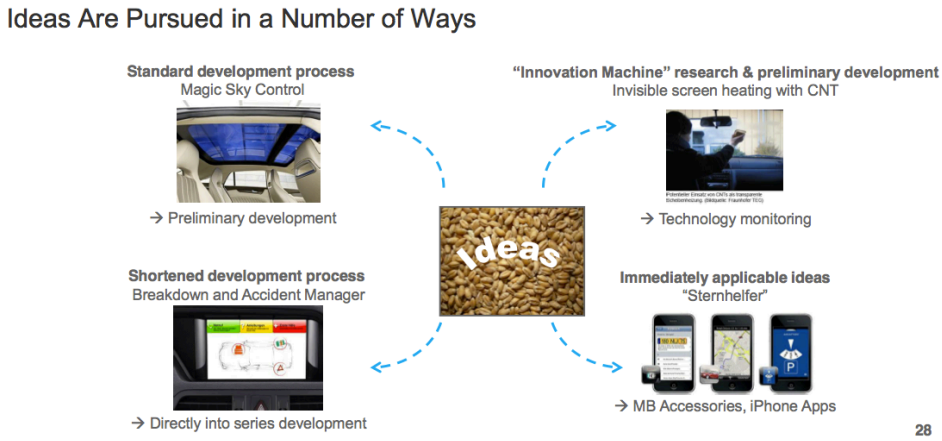

Figure 6.7: Rules of idea persuasion (Source: (Renner, 2011)).

This studio host's ideas generated through research by providing a creative environment based on a holistic and intercultural customer focus, and holds product acceptance tests through vehicle evaluation (Figure 6.8).

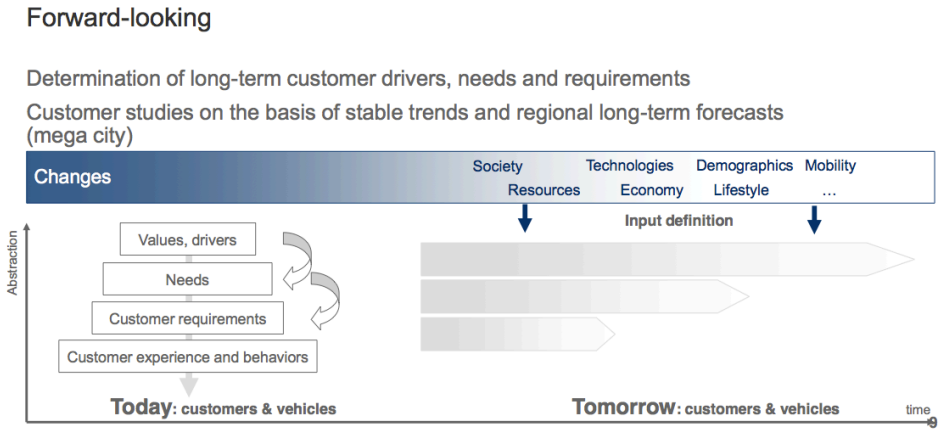

Figure 6.8: Customer Centred Research (Source:(Renner, 2011)).

6.2.3c Solution to the Above Given Problems

Company C is research focused on its customers to have a sound customer centric research Company C has developed a 500sq/m studio solely for customer-centred innovations.

All ideas generated at Company C could be pushed into the business through four pre-determined ways; first is standard developmental process; second is innovation machine research and preliminary development third is shortened developmental process and last is immediately applicable ideas. These rules have made it possible to push ideas into the production process and help in engaging all employees internally but has eventually led to loss of ideas, which initially were considered weak

Company C tries to encourage idea generation activity by creating an environment for creativity. Providing room for synergistic opportunities that trigger creative sparks in individuals does this and also systematically provokes coincidence likes multidisciplinary team discussions and brainstorming sessions.

6.2.3d Challenges to the Solutions

One of the biggest challenges to the above solutions is the culture of the design team and the organisation. Although they provide a creative and explorative environment, the rule bound idea generation and execution process might pose a threat to the way creative people would like to function. In a rule bound organisation, the flow of communication is rigid and lacks flexibility leading to slow outcomes.

Another challenge is the notion of depending on customers to understand their needs, as many believe that customers don't know what they want, hence they cannot make the organisations predict the future.

6.2.3e Achievements

Company C has achieved a strong brand identity. The customer now recognises the brand just by looking at the features of the product and can associate with it. The well-defined rules inbuilt in the organisations idea generation process have enabled Company C to accomplish good design (Appendix 11; Answer 6) in a short time standard design details. It has streamlined their innovation process by removing any room for processes and ideas that are not beneficial to the corporate interest.

For a detailed questionnaire please refer to appendix 11.

6.3 Data Analysis and Validation

As data had been gathered from multiple organisations, another triangulation was necessary to validate the data and crosscheck the results. At this stage triangulation was used to identify and to build the theory based on abductive reasoning.

The triangulation used data collected from the three organisations, case study findings and the opinion of a third party expert (Figure 6.9).

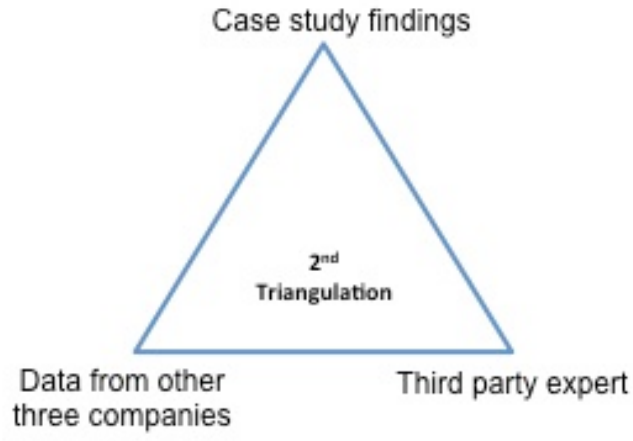

Figure 6.9: 2nd Data Triangulation.

Data from the three organisations was first contrasted with case study findings on a matrix (detail in Chapter 7, section 7.4.1). Abductive method was used to bring out most similar and different practices related to design and innovation strategy involving design. A semi-structured questionnaire was prepared (appendix 13), the transcript of which can be seen in appendix 14.

The triangulation will be discussed in detail chapter 7.

SUMMARY

This chapter stated that in order to get deeper knowledge and make the research design more robust, it was essential to explore three other organisations. The chapter highlighted the criteria for the selection of the organisations, which were inspired by Sinek's (2012) golden circles of 'why', 'how' and 'what'.

This chapter narrated the exploration of the three companies by highlighting five sections namely; the role of design in other organisations, problems attached with the role of design being carried out satisfactorily, solution to the given problems, challenges in the application of the identified solutions and the achievements. The

chapter confirmed that although design plays a very important part in decision making, the organisations studied are not yet ready to give it the status of a leading functional discipline in their organisations. Company A, where design has a place in strategic decision-making, gives the role the name of an inspiration provider instead of a functional leader.

This exploration exercise deepened the understanding of the application and status of design for the research project. It helped identify the practical issues related to design being established as a leading functional discipline.

DATA ANALYSIS

CHAPTER SEVEN: DATA ANALYSIS

The present chapter will continue the discussion, from previous chapter and explain how the data was coded, categorised and sense was made of the complex data collection by concentrating on technical aspects of data analysis. The chapter identifies choices made for coding, and the analytical process behind the identification of categories and themes for the study.

Coding is problematic, but not difficult. A code in a qualitative enquiry is more often a word or a phrase that symbolically assigns a summative, salient, or evocative attribute for a portion of language or visual data (Saldana, 2009). The present research consists of data in the form of an explicitly defined 'design innovation process map', transcripts from interviews for data validation and data triangulation, interview transcripts from other organisations, corporate presentations, conference proceedings, and a review of the closest theory to the practice of Design Driven Innovation. The extraction of valuable data was done in three phases that used extensive coding.

Constructivism, led me to a process of constant comparison and reflection on data collected during the three years of study. The data analysis phase involved intuition and other designerly skills like; data mapping, linking, and making sense of the connections between the participants, data, and my observations highlighting the abductive approach. To make the validation robust the data were further synthesised, analysed, compared with an inductive approach inspired from management studies which improved my understanding as well. The details of the coding process and validation in the three phases of the study will be provided in this chapter.

7.1 Phase 1: Analysis of the Design Innovation Process Map

The case study approach concluded with an explicitly defined 'design innovation process map' (Chapter 1; Section 1.3). This process map was a narration of the innovation process being followed at a strategic level at Philips Design. Further, the 'design innovation process map' had to be coded, and linked with the stored knowledge base at Philips Design, to bring about a better understanding of its inception, and to close the gaps within the process itself. This was done in two stages. Firstly, each step of the process map was given a narrative, which identified the action associated with this step. Secondly, each of the provided narrative were coded using 'process coding' one of the elemental coding method which later led to the identification of the understanding on which the process was built. Elemental coding was done at an early level, leaving descriptive analysis for later phases.

7.1.1 Elemental Coding for the Design Innovation Process Map

This coding was done to establish an understanding of the perfect fit, for the resources, and stakeholders, in the 'design innovation process map' at Philips Design. Elemental coding aimed at linking its outcomes, with the gathered data, and literature review within the case study.

7.1.2 Description of the Elemental Coding Process

The elemental method is the primary approach to qualitative data coding/analysis. It has a basic procedure of reviewing the data. According to Saldana (2009), consequently they build a strong foundation for future codes.

The Philips Design, 'design innovation process map' was coded by using 'gerund[50]' ("-ing") words to code actions (Miles and Huberman, 1994). The coding was

[50] Gerund – In linguistics, gerund refers to certain types of *non-infinitive verb forms.* In English language it denotes the use of a verb in its –ing form. In this study 'gerunds' are used to highlight the activities and actions associated with the different steps of the 'innovation process map'. See: Saldana, J. (2009) *The coding manual for qualitative researchers,* London, SAGE Publication Ltd.

helpful in observing simple activities in the process, and their connections. This method identified general human activities like reading, talking, thinking etc. from more conceptual activities like negotiating, adapting, and cooperating. Interestingly, the -ing words used in the elemental coding process (Figure 7.1), described the emerging categories in the study. During early coding, I saw that the process talked about past knowledge exploration of past scoping, but no reference was made to the understanding of what past knowledge was building the foundation of the process and where was this knowledge coming from. These knowledge gaps became clearer after the elemental coding was carried out on the process map.

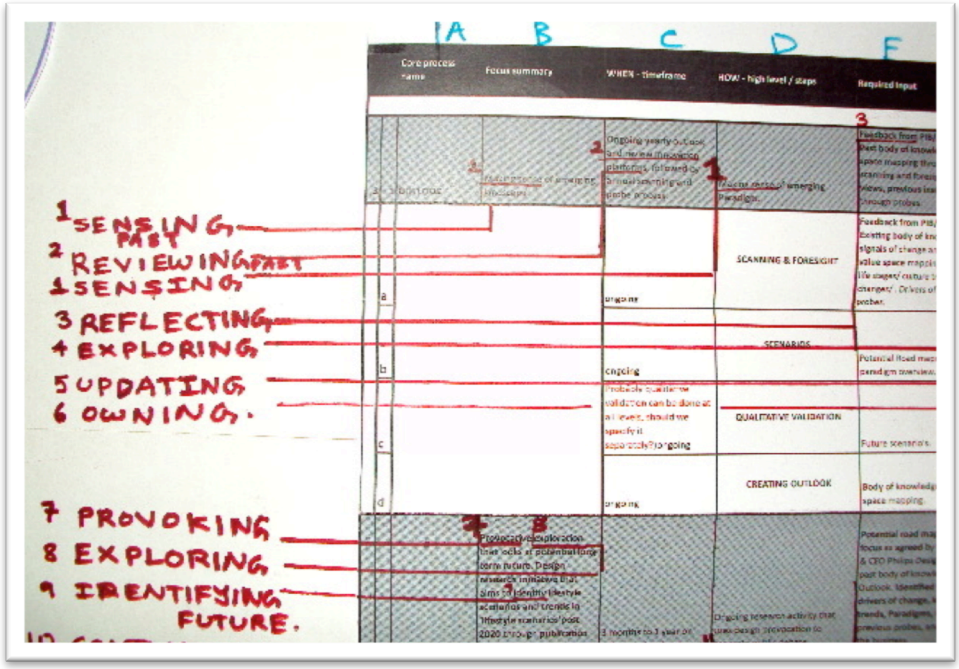

Figure 7.1: Elemental coding process (using the –ing words).

7.1.3 Source for the Elemental Coding

The main source for the coding was the 'the design innovation process map' of Philips.

The sources of data for construction of the process map were: the past 10 years literature from Philips Design in the form of process papers, PowerPoint presentations, articles, data collected from one-on-one interviews with the thinkers,

practitioners, and stakeholders within Philips Design, and data collected by Delphi technique during the case study (explained in Chapter 6).

7.1.4 Detail of the Process of Analysis

For the coding purpose, the 'design innovation process map' initially was converted into a narrative, and then coded. The narrative was constructed by attaching indicators such as 'if', 'then', 'when', 'so', or 'because'.

Each step in the process map had a narrative corresponding to it that explicitly defined the transition within each step of the process (Figure 7.2).

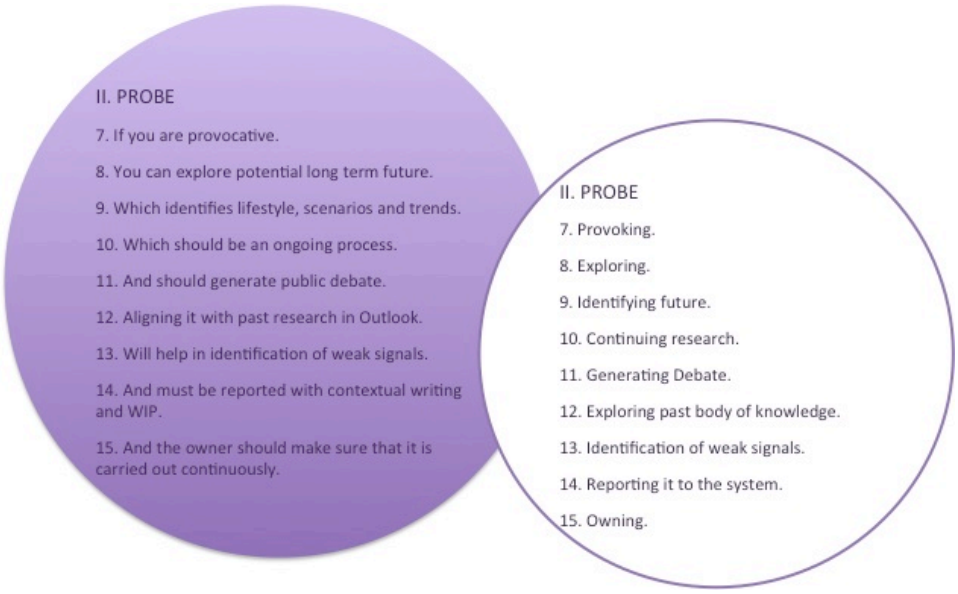

Figure 7.2: Narrative corresponding to each code (Appendix 12).

The analysis of the 'design innovation process map' highlighted the aspects of data that led to the formation of the process. These were:

1) The design translating the vision and mission of the corporation into a brand proposition statement formed the basis of the process.

2) Identification of the marketing platforms[51] to help resonate brand proposition and desired value proposition within Philips and its target audience.

3) Having a clear and concise Innovation architecture[52], a framework for developing chosen themes and value spaces[53] into IP (Intellectual property), value proposition and competencies to drive future business growth and a sound architecture for brand driven value space development[54].

4) Understanding of the internal innovation process based on the 4/4-matrix.

This body of knowledge was arranged chronologically as seen in figure 7.3. The narrative led to the arrangement of the information collected at Philips Design that brought about a better understanding of the inception of their innovative philosophy. It also provided a vivid description of transfer of important knowledge and information, right from the inception of their innovative philosophy, following the formation of their design innovation process, to their understanding of Philips Corporation.

[51] Marketing platforms - Philips Design has developed a sound understanding of the evolution of the economy from the industrial economy to transformational economy. They aim to move towards transformational economy through their value mapping process driven by Design. See: Brand, R. & Rocchi, S. (2011). *RE: Rethinking value in a changing landscape: A model for strategic reflection and business transformation.* Type to Philips-Design.

[52] Innovation Architecture - The involvement of design in the core processes of 'value development and proposition' for the Philips Corporation led to the 'brand' becoming a priority in the construction of its process. This is highlighted in Philips Design's, Innovation Architecture (Figure 4.9) that describes the psychology behind making this decision. See: Gardien, P. (2008b). *RE: Design research for innovation.* Type to Design, P.

[53] Value Spaces - These 'value spaces' are the themes of the future, which the Company will work on. The 'design innovation process map' identifies that further experiments are conducted on these 'value spaces' to create 'experience context' for the ideas. See: Brand, R. & Rocchi, S. (2011). *RE: Rethinking value in a changing landscape: A model for strategic reflection and business transformation.* Type to Philips-Design.

[54] Brand Driven Value Space Development – Brand driven value space development refers to the system of identifying future themes and new business propositions based on defined brand management strategy. This brand management strategy is established by a design function that works at the strategic level of the organization. See: Brand, R. & Rocchi, S. (2011). *RE: Rethinking value in a changing landscape: A model for strategic reflection and business transformation.* Type to Philips-Design.

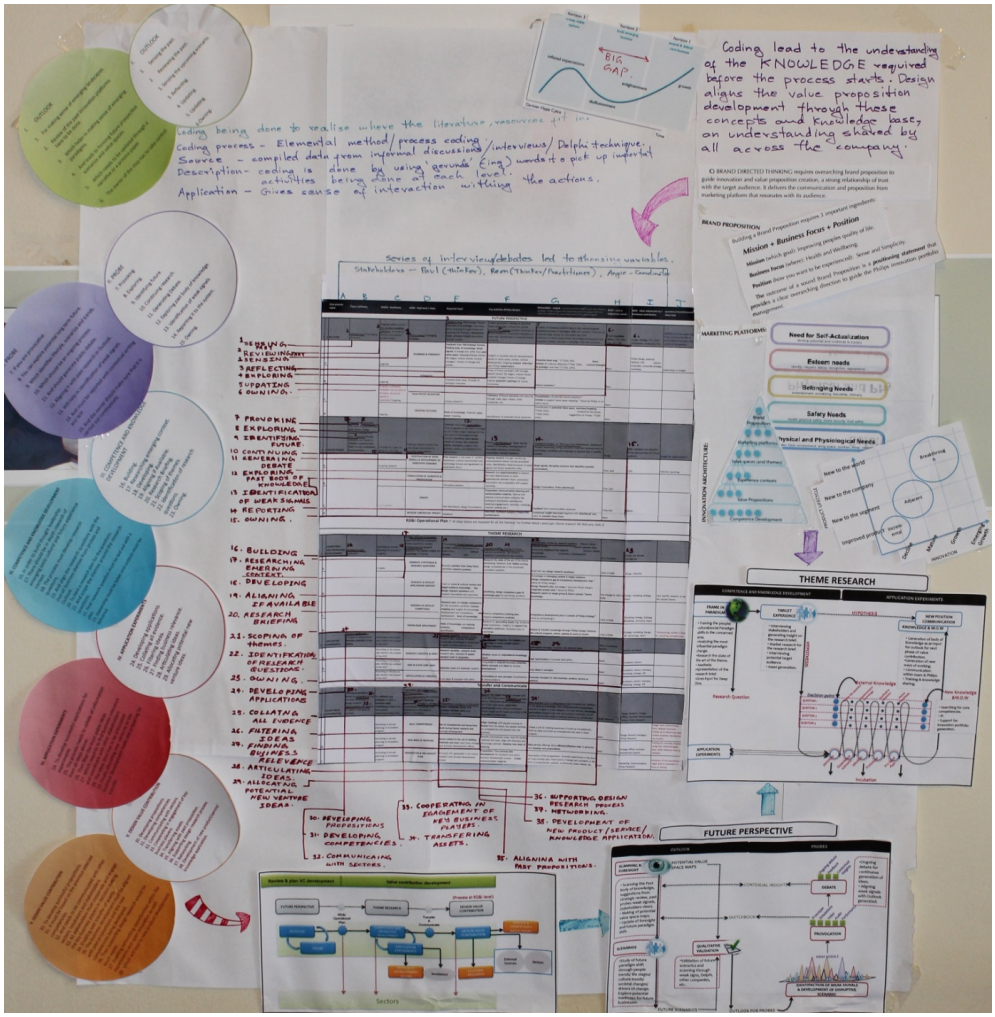

Figure 7.3: Design Innovation Process Map Analysis - Phase 1.

A consequence of the elemental coding of the innovation process map was emergence of categorical themes in the coded data. These categories emerged when the coding were grouped together as seen in figure 7.4. These broad categories were:

1) Past knowledge
2) Creative activities
3) Communication outside the team
4) Team requirements

INITIAL ELEMENTAL CODING		CATEGORICAL PLACEMENT
1. Sensing the past 2. Reviewing the past 3. Reflecting	12. Exploring past body of knowledge. 35. Aligning with past propositions.	PAST KNOWLEDGE
4. Exploring 5. Identifying future 7. Provoking 8. Exploring 9. Identifying future 10. Continuing 11. Generating debate. 13. Identification of weak signals. 16. Building 17. Researching emerging context. 18. Developing 19. Aligning	21. Scoping of themes 22. Identification of research questions. 24. Developing applications. 25. Collating all evidence. 26. Filtering Ideas. 27. Finding business relevance. 28. Articulating ideas. 29. Allocating potential new venture ideas. 30. Developing propositions. 31. Developing competencies. 34. Transferring assets. 38. Development of new product/ service/knowledge application.	CREATIVE ACTIVITIES
14. Reporting 20. Research briefing. 32. Communicating with other sectors.	33. Cooperating in engagement of key business players. 36. Supporting Design research process. 37. Networking.	COMMUNICATING OUTSIDE THE TEAM
6. Owning	15. Owning. 23. Owning.	TEAM REQUIREMENTS

Figure 7.4: Emerging categories after first coding.

7.2 Phase 2: Analysis and Alignment of Theory with the Practice of Design Driven Innovation

The second important aspect of data analysis was to align the outcome from the coding of the case study in phase 1, with the theory of Design Driven Innovation by Verganti (2009). The 'Initial coding method' was used to prove the similarities and differences between the theory and practice of Design Driven Innovation described below. The process of initial coding had to be altered to able to code a book in most efficient manner. Therefore, relevant sections of the book were coded including its graphical data.

7.2.1 Initial Coding for Design Driven Innovation by Roberto Verganti

The coding was done to establish connections, and differences, between the case study analysis and the theory provided by Verganti (2009) (Figure 7.5).

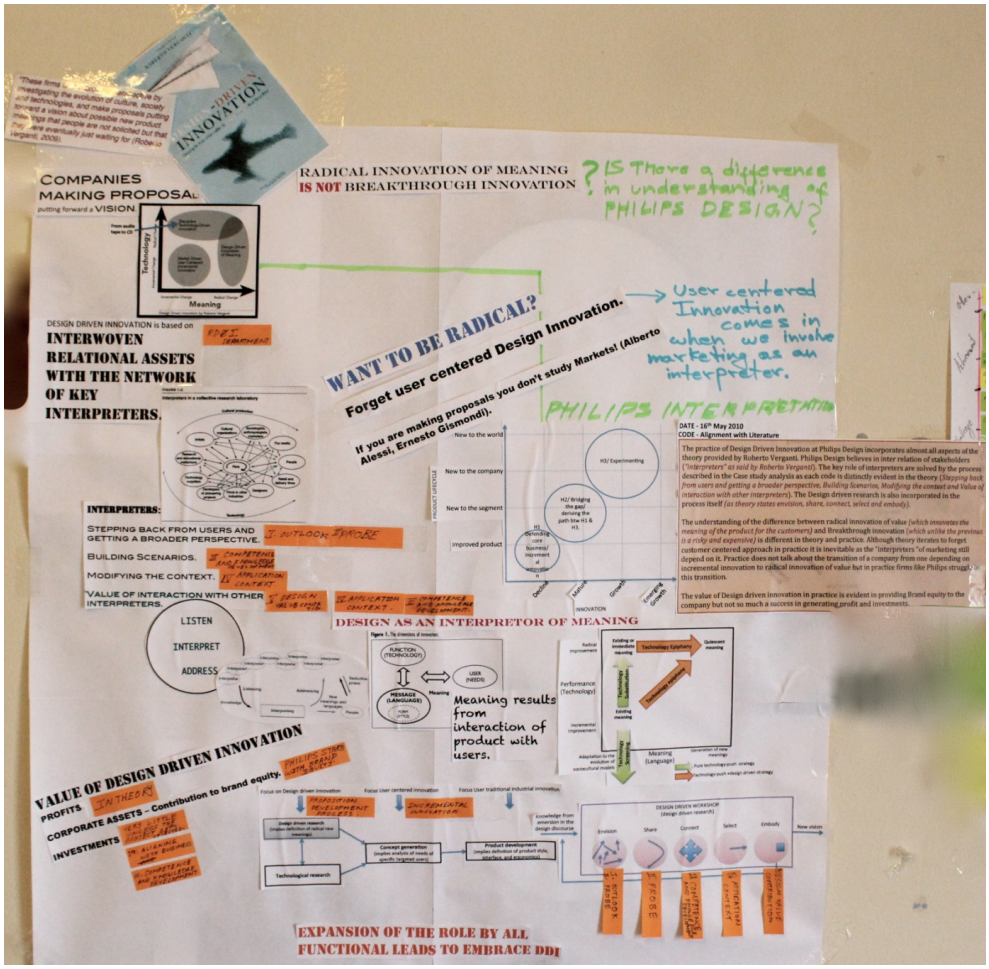

Figure 7.5 – Comparison of empirical data with theory.

7.2.2 Description for the Initial Coding Process

The process of initial coding broke down qualitative data from the book by Verganti (2009) into small parts, and examined them. Consequently, similarities, and differences were highlighted between the 'design innovation process map', and the theory provided by Verganti (ibid). This helped in constructing a better understanding while comparing the theory against its practice. Initial coding helped in a reflective analysis of the data and also provided the required freedom to use creative methods to establish these connections.

7.2.3 Source for Initial Coding

The data source for the coding was taken from the book 'Design Driven Innovation' by Verganti (ibid), and the analysis of the 'design innovation process map' done in phase 1.

7.2.4 Detail of the Process of Analysis

The initial coding was an exercise to highlight the similarities and differences between the two comparable sources.

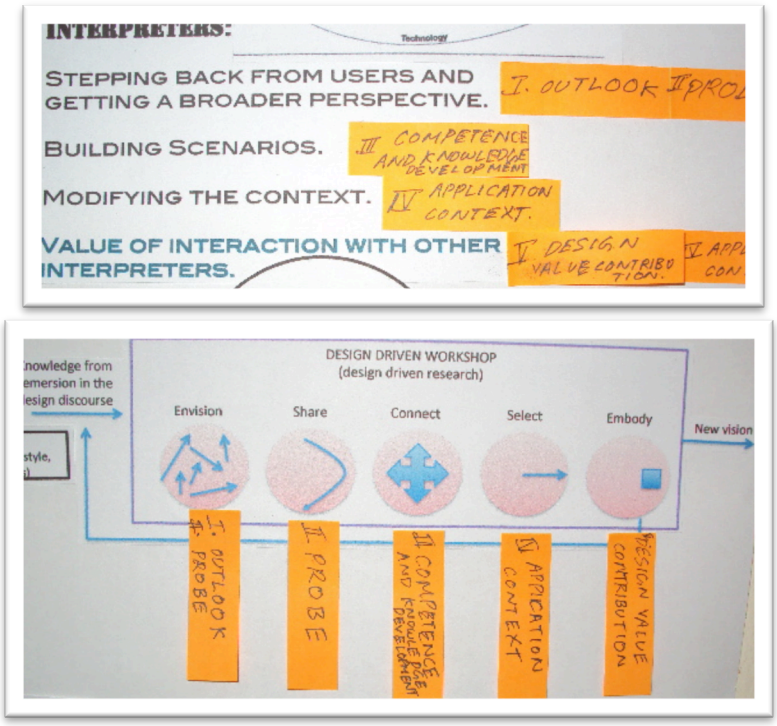

Figure 7.6: Coding of Graphics from the book and codes with analysis in Phase 1.

The codes from the 'design innovation process map' (Figure 7.1) were taken and put against relevant sections pulled out from the book (Figure 7.6). This made it possible to align the similarities between the two sources. Similarly, I reflected upon the theory and highlighted the differences between them as well. Once the analysis was complete a short text memo was created to summarise these initial findings (Figure 7.7).

DATE - 16th May 2010
CODE - Alignment with Literature

The practice of Design Driven Innovation at Philips Design incorporates almost all aspects of the theory provided by Roberto Verganti. Philips Design has evolved the relationship with interpreters as stated by Verganti (2009) by extending this relationship towards their internal stakeholders and through extensive collaboration with external explorers as well.

The way these interpreters practice their skills are based on the theory of Verganti (2009) where he specifies that the interpreters have to step back from the users and get a broader perspective, build scenarios, modify the context and value of interaction with other interpreters.

The process of Design Driven Innovation research theory is well translated in the RD&I process being followed at Philips Design. When compared the step 'envision' relates to the initial two steps of Philips Design innovation process named Outlook and Probe; the step 'connect' refers to the next steps in the process named competence and knowledge development, the step ' select' relates to the process step named Application experiments and 'embody' relates to design value contribution.

The comparison has highlighted the difference in understanding of two terms 'radical innovation of value' *(that innovates the meaning of the product for the customers)* and 'breakthrough innovation' (*which unlike the previous is a risky and expensive)* in theory and practice.

Theory instructs innovators to forget customer centered approach, whereas in practice it is impossible for the "interpreters "of marketing to ignore it.

The value of Design driven innovation in practice is evident in providing Brand equity to the company but not so much a success in generating profit and investments as stated by Verganti (2009).

Figure 7.7: Coding Memo for phase 2 analysis.

The analysis of practice as against the theory of Design Driven Innovation evolved further and four important gaps were identified. These identified gaps highlighted the need for further research in the theory (Discussed in chapter 5).

7.2.5 Data Triangulation between the 'Design Innovation Process Map', Literature Review, and the Third Party Expert

Phase 2 analysis involved data triangulation between the 'design innovation process map', literature review, and a third party expert (Figure 7.8). A third party expert was identified based on his experience of innovation process at Philips Design and his knowledge of innovation practices and theories in other organisations. A semi-structured interview was carried out with a third party expert (Appendix 8). Further, the transcript of this interview was coded, using 'description coding'. The codes were then compared with the analysis of the 'design innovation process map' done in phase 1, and literature collected during the research. The end of this coding and analysis saw the development of broad categories for the research.

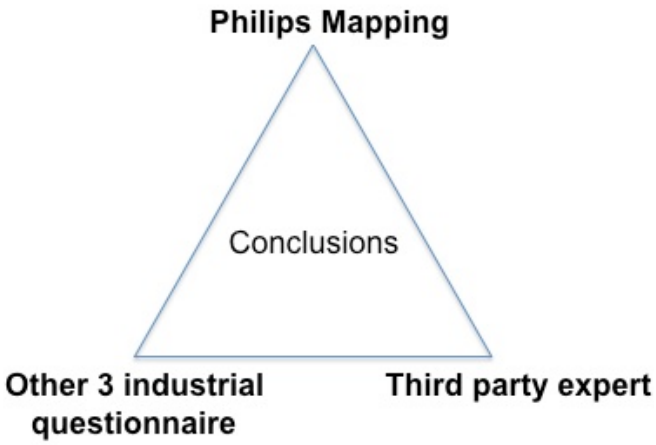

Figure 7.8: 1st triangulation.

7.3 Emerging Categories and Themes

Coding in the second phase identified prominent categories in the research data. This led to a categorical approach to further research analysis.

For this purpose the method of pattern coding was chosen. According to Saldana (2009), pattern coding refers to self-explanatory codes, which identifies emergent themes, by accumulating the codes from previous coding cycles. It helped me group together similar material into meaningful units of analysis (Figure 7.9).

INITIAL CODING OF THE BOOK	CATEGORICAL PLACEMENT
	PAST KNOWLEDGE
• Changes for Design Driven Innovation to happen. • Corporate investments. • Corporate assets.	**KNOWLEDGE & CAPABILITIES**
• Investigating the culture, society and technologies. • Making proposals putting forward a vision about possible new product meanings. • Radical Innovation. • Stepping back from users and getting a broader perspective. • Building scenarios. • Modifying context. • Listen • Interpret • Address • Design as an interpretation of meaning.	**CREATIVE ACTIVITIES**
• Network. • Building a collective research laboratory. • Value of interaction with other interpreters.	**COMMUNICATING OUTSIDE THE TEAM**
• Key interpreters.	**TEAM REQUIREMENTS**

Figure 7.9: Pattern coding into categories in Verganti's theory.

According to Miles and Huberman (1994, p. 69),

> *"Pattern coding is a way of grouping those summaries into a smaller number of sets, themes or constructs".*

Due to the reflective loop of the analytical process, the study allowed me to reflect on the groups of data more closely. The categories that emerged from this phase with the analysis of the 'design innovation process map', and phase two, the coding of Verganti's book, and the first data triangulation were:

- Past knowledge,
- Knowledge and capabilities,
- Creative activities,
- Communicating outside the team,
- Team requirements,

The above categories had a repetitive character. Therefore, I combined them to form three strong themes for the research. In future, all outcomes of the study were categorized within these three themes (Figure 7.10).

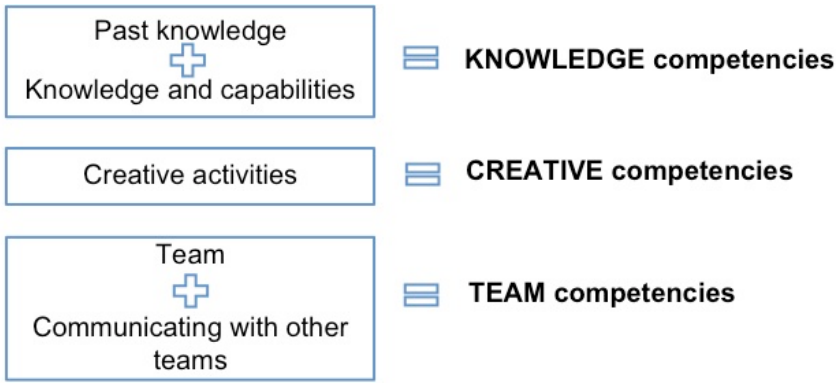

Figure 7.10: Making of Themes from categories.

7.4 Phase 3: Final Analysis of Explored Organisations, 2nd Third Party Interview and Final Triangulation

Three other organisations were explored to understand the extent of influence design could have at strategic level in organisations apart from Philips Design. The organisations were chosen based on strict criteria already explained in chapter 6.

7.4.1 Coding of the Interviews of Other Three Organisations

Each interview was transcribed and coded using descriptive coding. In addition to that the codes were arranged in a matrix format (appendix 17) to establish similarities, and differences, between all the organisations explored in relation to case study data analysis.

7.4.2 Source for the Coding of Other Organisations

The data source for the coding was provided by the interviews conducted from other organisations, their conference proceedings, and shared information by the participants.

7.4.3 Process of Analysis of the Interviews of Other Organisations

In addition to the three themes, six parameters emerged from the coding of the interviews of the other organisations. The collected data from different organisations as shown in appendix 17 were arranged on a matrix divided into these six parameters.

The x-axis of the matrix had the organisation names, and the y-axis had the parameters as stated below:

- Role of design in an organisation,
- Problems in pursuing the role of design,

- Reasons for the existence of the problems,
- Solutions to the problems,
- Challenges to enable good solutions,
- Achievements for design in organisations.

The process of analysis in matrix form can be seen in Figure 7.11.

The previous three identified themes were highlighted in the matrix through the use of color codes. Yellow symbolises the; ‘knowledge competency’ theme, green the; ‘design competency’ theme, and orange the; ‘team competency’ theme. The use of colour coded display of themes helped in visualising the most prominent influences in each of the 6 different categories helped to visualise, the role of the most prominent theme, in each of the six different categories.

Figure 7.11: Industrial data analysis in a matrix format.

7.4.4 Data Triangulation with the Third Party Expert

In addition to the above comparison, triangulation was carried out to highlight the most prominent outcomes of the research (Figure 7.12).

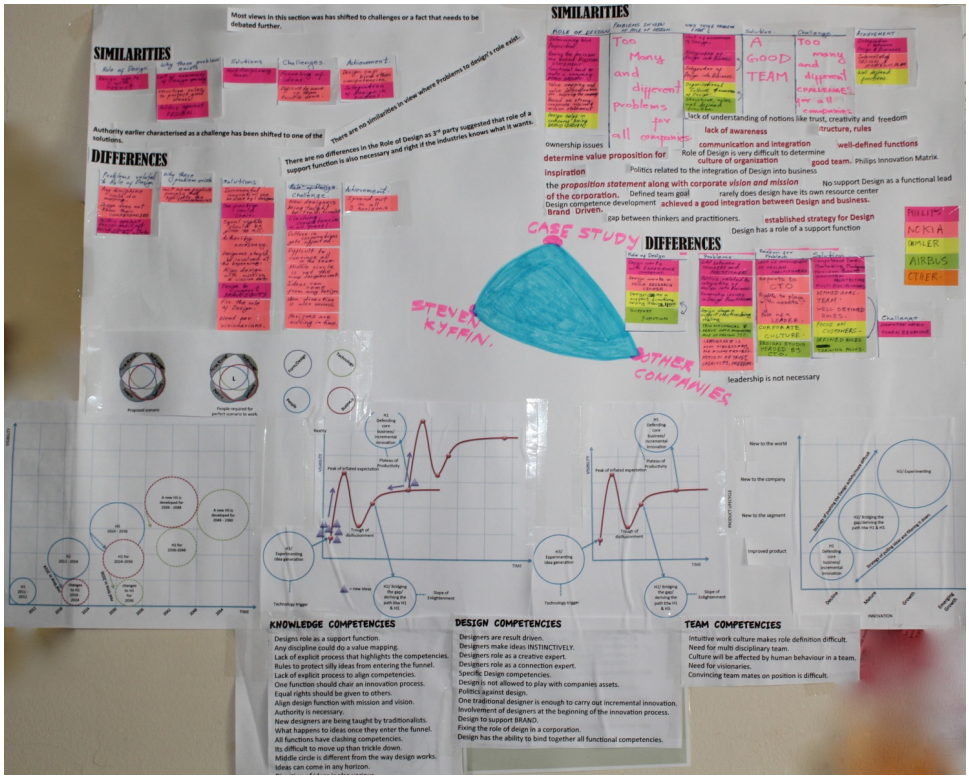

Figure 7.12: Final Triangulation and Analysis.

Triangulation of data was done between: innovation theories and best practices in other explored organisations, compared with the best practices as analysed in phase one, and the third party expert who has the knowledge of best practices of Philip Design as well as the knowledge of academics and other organisations, and who was not involved in Philips Design innovation.

7.5 Connecting the Codes to the Themes

Once the formation of themes was complete, the codes of the 2nd set of interviews with the third party expert were also attached to these themes. The interview was transcribed (appendix 14) and coded using a descriptive coding process (Figure 7.13, Appendix 16). Once the codes emerged, categorical questioning helped in putting them in their respective themes.

Figure 7.13: Descriptive coding of the 3rd party interview.

A reverse method of asking 'categorical questions' was used to assign the codes to their respective themes. In this method each code was asked four respective questions specific to each of the themes. The code that answered all four questions of a particular theme was assigned to that theme.

7.5.1 Themes and their Categorical Question

The three important themes that come out of my study and the four questions assigned to them are:

1. Knowledge competencies: Since this theme emerged from two other categories i.e. 'past knowledge' and 'knowledge & capabilities', its questions reflect the requirements of these categories in particular. The questions are:

- Does the code describe a new knowledge being acquired by the organisation/ team/ function/ discipline?

- Is the code a learning outcome that would affect the way the organisation works?
- Does the code describe something new that the organisation has learnt?
- Is the code related to knowledge, the organisation acquired from their research done in the past?

2. Creative/design competencies: Since creativity predominantly is a part of a design team in organisations, this category takes the codes that talk about creative aspects of innovation, the process dedicated to design, design thinking, and skills that designers need to enable a successful innovation. The questions that are in this category include:

- Is the code a statement/knowledge/skill required particularly for designers to run the design process?
- Does this code describe a skill/statement required only by designer's?
- Is this code a statement/issue related to a design problem?
- Does this code describe the creative aspect of the design team?

3. Team competencies: As this theme emerged by combining two categories 'communicating to other teams', and 'team skills', the categorical questions adhere to both these categories:

- Does this code specifically talk about a problem/statement related to the whole team?
- Is this code highlighting a communication problem?
- Is the code related to control/ leadership/ ownership issues?
- Does the code highlight any collaboration issue?

The codes were fitted in their respective themes by keeping in mind the categorical questions (Figure 7.14). For example, for response 40, the coding defines it as the

existence of multi-levels of innovation within the design process. Hence, the code answers the question:

- Is the code a statement/knowledge/skill required particularly for designers to run the design process? – Yes as the code describes the detail of a design process.
- Does this code describe a skill/statement required only by designer's? – Yes this is important information for designers and helps them understand the complexities of a design process.
- Is this code a statement/issue related to a design problem? – Yes this statement is related to a design problem related to the participation and understanding of its practitioners.
- Does this code describe the creative aspect of the design team? – It does not, but on the other hand it describes the understanding of the designers of their own creative innovation process.

As the coding fits perfectly with the questions above, they were categorised as a design competency (Figure 7.15). Other categorizations can be referred in appendix 15 and 16.

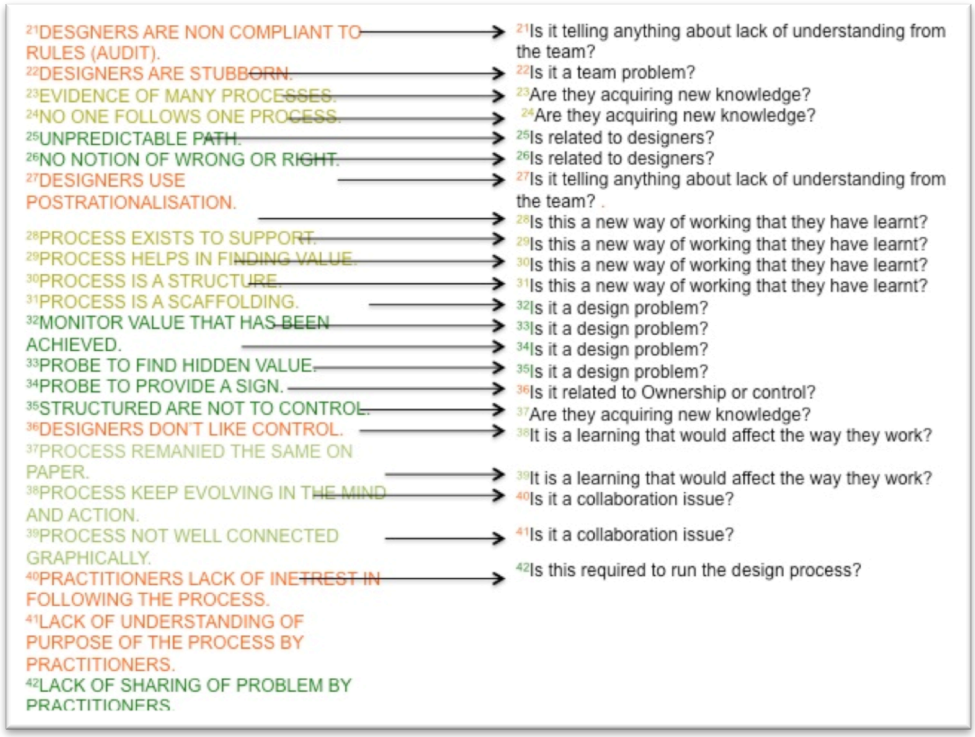

Figure 7.14: Questioning the codes to fit to themes.

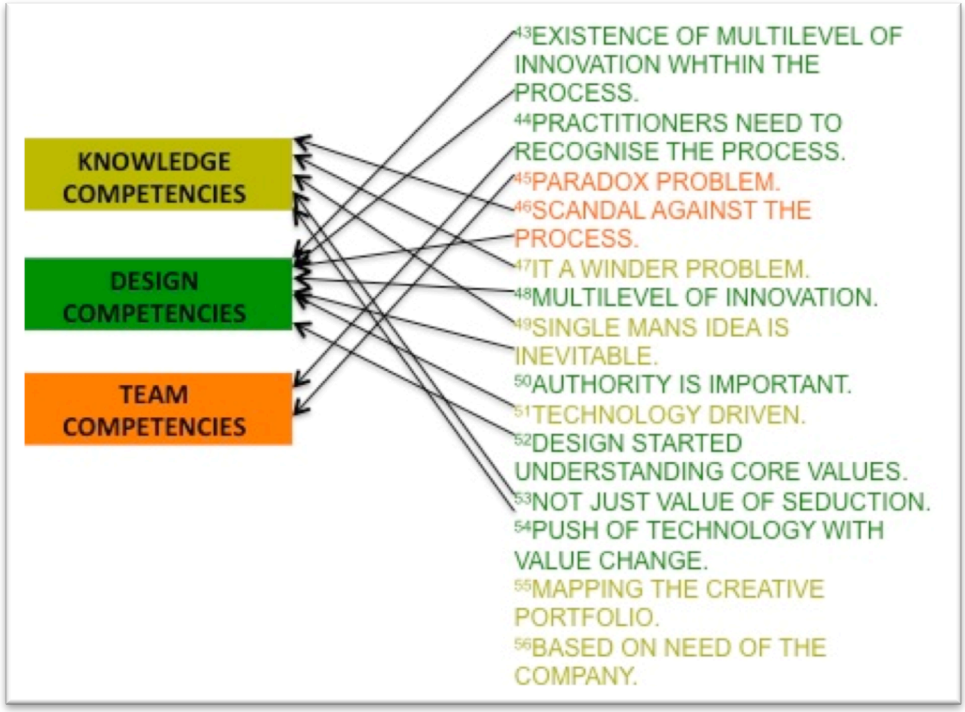

Figure 7.15: Placing Descriptive codes into categories.

These themes, in practice are interrelated, and are a consequence of each other. For example, sound knowledge competencies are required to understand, and

determine a good innovation process. A process that has a good background based on knowledge competencies has more resources to fall back on in case of sudden change. Once an organisation has a sustainable process that is able to restructure itself, along with the external, and internal influxes, it can work on building creative design competencies. The design/creative competencies are required to make the participants of the process more agile and effective, in order to get the most out of the process. It's not just creative competencies that make a good process but a good process, is the consequence of good teamwork. Hence, team competencies are very important as well.

SUMMARY

This chapter introduced the methods and techniques used to analyse data at every level of the study under a constructivist approach and action research cycle. Strauss and Corbin's (1999) structured qualitative analysis process formed the backbone of the analysis and allowed me to construct a theory as I went along.

Different coding practices were taken at different levels of research. The overall coding process took place in 3 phases. The first used an elemental coding method called process coding to extract actions related to each step of the 'innovation process map' defined during the case study. The coding was done to bring out categories in the data, which later helped in the progress of the study. The second phase, made a comparative study, of the theory provided by Verganti (2009) in his book 'Design Driven Innovation', with empirical data collected at Philips Design, and coding outcomes from the first phase. This phase linked the observations made during the case study, with the theory, and in the end enriched the content in the categories. The third phase, used a pattern-coding process to transfer the categories into emergent themes by coding the interviews of the three other organisations explored in the study, along with the final data triangulation. The chapter also

highlighted the creative process behind making connections and sense of data by providing pictures of the actual designerly methods used apart from the coding.

FINDINGS OF THE STUDY

CHAPTER EIGHT: FINDINGS

The previous chapter described the data analysis process that took place in three phases of the study. This chapter will be about highlighting the findings that came out in different phases of the research.

This chapter begins by stating findings of phase 1 & 2, from the case study at Philips Design, and the first data triangulation, respectively. Followed by, the phase 3 findings, which were derived from the exploration of three other organisations. These findings are described under six parameters that were used for the analysis of this data set. Later, the chapter describes the final findings suggested by data analysis after final data triangulation with the third party expert. These are described under the three core themes, namely, knowledge competency, design/creative competency, and team competency.

The final analyses were fed back to Philips Design and provided them with recommendations for the strategic innovation process. For this purpose my supervisors and I organised a meeting at Philips Design and I presented the study followed by a series of discussions and suggestions. This chapter also highlights the points I fed back to Philips Design and the feedback I received in return. The chapter concludes by highlighting the attainment of the aims and objectives and gives a summary of the research outcomes and key findings.

8.1 Phase 1 and Phase 2 – Findings From The Case Study and 1st Data Triangulation

The case study approach concluded with an explicitly defined 'design innovation process map' of the strategic level innovation process, for the purpose of value proposition, and development for Philips Corporation by Philips Design (Chapter 1; Section 1.3).

As seen in the last chapter, the process map was coded and then its codes were compared to the literature closest to the practice at Philips Design. Similarities and differences were drawn between the two sources, as described in chapter 5. Additionally, the process was validated with a 3rd party expert through triangulation, and the findings were refined, and developed further.

Four important arguments arise from the refined findings, and the understanding behind the conceptualisation, and practice of a robust strategic innovation process by the Philips Design team.

- **The Existence of a gap between thinkers and practitioners:** Innovation process mapping was a necessary task that highlighted the problem that exists in the foundation of the Philips Design's RD&I team (research, development and innovation team). The long-term effect of this gap on the organisations and on the team is phenomenal. This gap is not just a problem experienced by Philips Design but it exists in every organisation. This is one of the key reasons following a successful design innovation process at Philips Design. This problem has also been supported by eminent writers like Deal and Kennedy (1999), when they talk about effects of mergers, or dissolution of work, on corporate identity. This gap is a consequence of the conflict an individual goes through when a contract between workers, and the organisation fails to satisfy either of the party (Hofstede, 1991). The causes are also related to culture (Fisher, 2003), acceptance of change within the organisation (Bhatia, 2009), human behaviour (Olins, 1978) and leadership (Olins, 1978, Marcus, 2002).

- **Ownership:** Personal observations, empirical evidence collected during Delphi workshops[55], and reasons to change the method of interview from being structured to semi-structured led to suggest that Philips Design was suffering from a situation, where, the issue of ownership ran into two extremes. On one hand a practitioner would not take responsibility of a step in the innovation process and its requirements and, on the other hand a practitioner would not share the way he/she works with the rest of the team. It was only under pressure of leadership that the practitioners shared their way of working with other team members. Under such ambiguous circumstances, it became very difficult to run an innovation process without communication gaps and loss of good ideas and useful information.

- **Brand translates directly into design:** At Philips, brand is directly transformed into design leadership and is used to identify the brand architecture and to resonate a brand management strategy throughout the organisation. Design activity is translated into enhancing the essence of brand in the eyes of the receivers. Design activities at Philips Design, whether strategic decisions, or incremental design developments, are most visible through the products. These products are, among others, tools helping the organisation to translate image, identity and communicates it to the target customers (Gardien, 2009). This scenario was seen more likely prominent in a consumer goods organisation.

- **Communication of design value creation:** Philips Design follows a procedure of mapping the content being developed through design value propositions. Unfortunately, no system is in place to record the methods

[55] Evidence collected from Delphi Workshop: Delphi workshop involved multiple participants who, by the end of the internship were no longer associated with Philips Design. To protect them and the information shared by them it was agreed to anonymise all data collected from Delphi workshop into the Philips Design process map (Chapter 1, Section 1.3). No individuals participating in making of the process who were later not a part of Philips Design have been named until they have consented to do so.

that are being used to develop these propositions. Values are mapped with the help of value mapping tools that have been a part of Philips Design, but this value is not being communicated to other stakeholders in Philips Corporation. There are no defined tools that make a database of created value, and communicate this value to the Philips Corporation. Therefore, there is a problem of sharing and communicating design activities with the extensive team.

8.2 Phase 3: Findings with Other Explored Organisations

The above findings were made more prominent after the exploration of three other organisations. It showed that the problems indicated above are not just a concern to Philips Design, but prevail in all organisations that were explored.

The analysis arranged the data from the interviews with the three organisations in a matrix (Appendix 17). This format assisted the development of an understanding about the requirements that could help establish design as a leading functional discipline and lead the innovation process. The findings described the similarities and differences between the Philips Design and three other organisations based on the six parameters used to analyse data.

8.2.1 Comparison Between All Three Organisations And Philips Design

This section describes in detail the comparison of data between the three organisations and Philips Design under the six parameters.

8.2.1a Role of Design in the Three Organisations and Philips Design

On comparison, there were a number of similarities in the role design can take in organisations. Design's role is directly connected with an organisation being brand driven**.** As a support function, design focuses on enhancing the resonance of the brand essence to the organisation's customers (Chapter 6; section 6.2.3). Similarly,

in leading innovation thinking, design's role is to inspire the organisation (Chapter 6; section 6.2.1).

Design usually plays the role of a support function in that is predominantly driven by technological innovations (Chapter 6; Section 6.2.2 & 6.2.3). In addition to this, design is also seen contributing to future propositions (Chapter 6; Section 6.2.1) and developing value in form of new business propositions (Chapter 4; Section 4.4.2). Almost all organisations use design skills to propose, and map value for the future, which might not primarily be at the strategic level as seen in Company A of the compared companies in Chapter 4.

The most prominent difference in the use of design was seen in the consumer goods organisations like Philips and Company A, where design could easily be established as a leading functional discipline and integrated with other important functions at the strategic level. Unfortunately, limitations exist due to the fact that designers do not have the authority to play with the assets of the organisations (Chapter 6; Section 6.2.1b). Most of them don't even have the knowledge of the competencies that exist outside their team. Very rarely does design have its own resource centre[56] in companies despite the fact that design plays a role of a leading functional discipline.

8.2.1b Problems Faced by Design to Lead a Functional Role as Strategic Level

The data suggests that innumerable problems surround the role of design stopping it from being established as a successful leading functional discipline in organisations (Chapter 7, figure 7.11). The most prominent of them is the inability of integrating the ambiguity and intuitive thinking of design with business, which proclaims the existence of an immense structure, rules, and well-defined functions. Few agree that an explicit process could be a solution to the problem (Chapter 6;

[56] Resource centres – A design studio with resources that help design build its competencies and enhance the communication within the team.

Section 6.2.2d & 6.2.3d). Another problem is the lack of involvement of design practitioners in the formulation of design innovation process, which leads to lack of ownership towards the process (Chapter 3, section 3.5.1).

8.2.1c Reasons for the Existence of the Problems for Design to Lead a Functional Role at the Strategic Level

The data highlights that the explored organisations also experience the lack of awareness among the stakeholders regarding the role design plays. Additionally, the culture of the organisation is not seen to be supportive of design activities and creative thinking, leading to a lack of support for design teams (Chapter 6, section 6.2.2, 6.2.3). Data analysis indicates internal organisation politics, fear, and inability to accept change as other reasons for design to be unable to take a leadership role (Appendix 8).

There is a difference of opinion among the organisations in the concept of leadership. For some, leadership is not necessary for the design process to run successfully (Appendix 8), whereas others believe design needs a leader (Appendix 14, Question 4). This leads to differences in the understanding of culture, trust, creativity, and freedom in different organisations.

8.2.1d Proposed Solutions for the Problems Surrounding Design's Role as a Functional Leading Discipline in Organisations

The explored organisations unanimously agree that having a good team could support the efficient role of design. In addition to a strong team it is essential to have a defined team goal, including defined actions for each of the external stakeholders. Contrarily, the study confirms that the organisations struggle to achieve these solutions at practitioner level.

Two potential solutions that claim to enhance the understanding and value of design in an organisation are; first, the development of a strong design competency

that could integrate the team activities to address organisation ambitions; second, an understanding and agreement of the positioning of the organisation in the market in comparison to their competitors. This has been done well by Philips Design through their theory of marketing platforms (Chapter 4, Section 4.6.2, figure 4.11).

8.2.1e Challenges Surrounding the Implementation of the Proposed Solutions to Enable Design's Role to Become a Successful Leading Discipline in Organisations

The biggest challenge is the understanding of human behaviour and the role of organisational culture in organisations. Design teams in organisations do not have good leadership, as individuals belonging to other functions are leading most design teams (Chapter 6; Section 6.2.1). This leads to differences in understanding the work culture between the thinker and practitioners of a team. Further, this widens the gap between thinker and practitioners in the design team.

8.2.1f Achievements for Design in Organisations

Organisations have tried to incorporate the right culture to nurture a good design team for efficient design practices, and creative thinking. A satisfying level of integration between design and business has been achieved with design as a support function but this integration has not been achieved with design being a functional leader in an organisation (Chapter 6; Section 6.2.1). Empirical evidence shows there are many challenges that still surround the above achievements.

8.3 Findings Suggested by the Data Analysis

The findings stated above were further triangulated with a third party expert, before the final conclusions were drawn for the study. The final conclusions were put into the three broad categories that answered the important questions that are closely, but not directly related to the establishment of the leading functional role of design

in an organisation. This was due to the fact that the study had touched upon a lot of other factors that influenced aspect of design's role in an organisation. The broad findings as described after the 3rd phase of triangulation process are as follows:

8.3.1 Creative/Design Competencies

The list highlights the findings in the area of creative/design competencies for the study:

1. Design can lead as a function provided it has an explicit process that can be updated, refined and reflected upon as time moves on (Appendix 14, Answer 15). An explicitly defined process will be a way of showing value of design to the members of that organisation culture.
2. Design should bring out the distinct brand identity of the organisation. Design in most organisations is used as an agent, which reminds the customer about the organisations brand identity. Design should align with the brand (Appendix 17).
3. There is a strong political influence that stops design from establishing itself as a functional leading discipline and having a strong strategic role in organisations like Philips. This is predominantly happening because design is not recognised as a strong strategic influence in our organisation cultures (Appendix 14, Answer 11).
4. In the 4/4-matrix of figure 8.1, it is harder to push an idea from horizon 1 (H1), to horizon 3, (H3), than to trickle the ideas downwards. The middle circle is controlled, and is different from the way designers work. Philips Design tries to spread the rules throughout the three circles by working in teams across all horizons and mixing individual competencies).

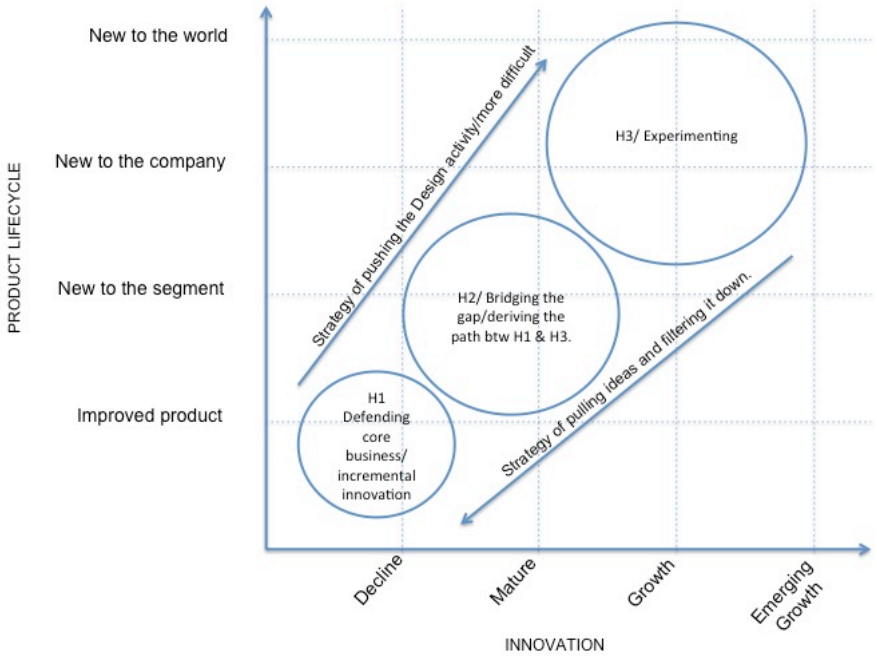

Figure 8.1: 4/4 Matrix (Evolved from: (Cross, 2008)).

5. The decision of the role of design in an organisation is a discretion and understanding of the organisation about its where they want to go in the future and if they require design to get there. In case organisation decides on using design as a support function then design must abide by it (Appendix 14, answer 6).
6. There is a need for visionaries in organisations. They help to identify new values, the right people, and the right competencies (Appendix 14, Answer 9).
7. Design should be allowed to play with the assets of the organisation (Chapter 6, section 6.2.1; Appendix 17). This will help to enhance communication and share knowledge, between design and other disciplines and help design get recognised as a leading functional discipline. None of the organisations explored have been able to achieve this in their organisation strategy (Appendix 14, Answer 13; Chapter 6).

8.3.2 Knowledge Competencies

This list highlights the findings in the area of knowledge competencies that an organisation needs to establish design as a functional leading discipline.

1. The final analysis confirms the gap that exists between the thinkers, and practitioners in a design team (Appendix 17).
2. The final analysis confirms that any discipline could do value mapping; however design is capable of playing a co-function to research and technology (Appendix 14, Answer 9). The research also confirms that research and technology are central to value development in most organisations (Appendix 17).
3. Design must be involved early in the decision making process (Appendix 14). Literature has confirmed that design has the appropriate insights of understanding of people together with ethnographers would help the envisaging of the future solutions. Design's involvement at the start of the decision-making process will enable the team to imagine what the application of technology in a particular context can mean and respond to the new business propositions.
4. It is important to identify the competencies of a design team. Ideal state of competencies today must have an overlap as shown in figure 8.2 (Appendix 14, Answer 9). Unfortunately, the way competencies are arranged in reality is depicted in figure 8.3, where we see clear separation between each function. Evidence can be drawn from the structure of universities, organisation functions etc. that does not enable a common ground for all functions to exchange and share knowledge and create new competencies.

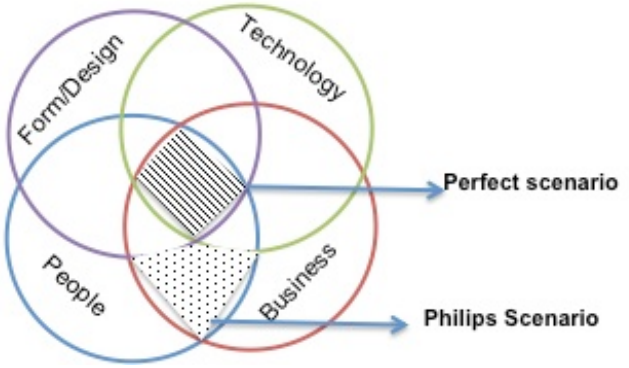

Figure 8.2: Psychological scenario as perceived by all functions.

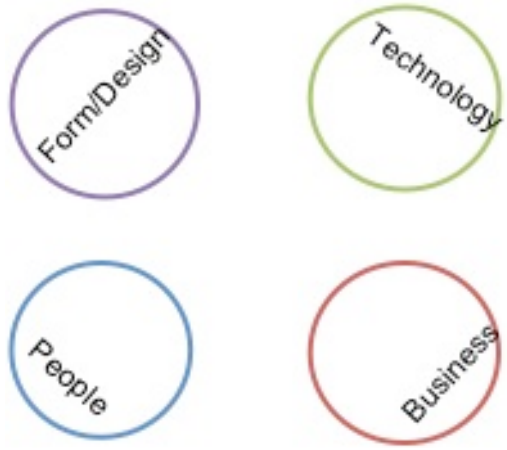

Figure 8.3: Real scenario of competencies.

5. Designers are predominantly found to have three general competencies (Appendix 14, Answer 3; Appendix 17). This was analysed, keeping in mind the three types of innovation cycles and rationale that designers, working in each of the innovation type require specific competence development (Appendix 17). The first competence involves 'creative way' of doing (Brown, 2009), second is the connectivity competency (ibid), which is needed to make design lead a strategic process, and thirdly, it is the competency of exploration.
6. It is the chief marketing officer (CMO) who makes most decisions in market driven organisations about competencies (Appendix 17).
7. The analysis identifies different ways an idea can be monitored. One way is to recognise delicate ideas and protect them. Another way is to throw all

ideas in the air and see which one would survive existing scenarios within the organisation. Organisations also make rules to protect weak ideas from going through the innovation funnel (Appendix 14, Answer 10).

8.3.3 Team Competencies

The list highlights important findings in the area of team competencies, which is essential for a design team to be established as an effective functional lead:

1. Designers are generally result driven people and they are not conscious of the problem solving or the creative process they go through (Brown, 2009).
2. Designers make proposals based on their intuition. To support their inability to consciously judge their process, they must be accompanied with other disciplines. This makes the design team in multinational corporations intra-disciplinary in nature (Appendix 14, answer 2).
3. The corporation has to develop a culture that supports the team involved in design thinking and its practice. Internal organisation training and guidance can lead a team to work well (Appendix 18).
4. All functions that are important for the organisation in the decision making process should be involved at the strategic level of decision making in the organisation. To make decision making simpler, one of the functions could take the role of chairing discussions at the strategic level but equal authority must be given to all (Appendix 14, Answer 9).
5. Authority is an essential ingredient for a successful innovation process (Appendix 14, Answer 15).

8.4 Phase four: Presenting At Philips Design

The scope of this research was outlined by the case study, which was part of an empirical enquiry, where I was a participatory observer stationed at Philips Design, conducting one-on-one interviews and using a Delphi technique for data collection and refinement to map their strategic innovation process. As Philips Design has

been a part of the study since its inception, and the research followed an iterative loop of action research cycles that enriched the findings of the case study, it seemed appropriate to feedback the final findings to Philips Design (appendix 20).

8.4.1 Critical Arguments for Philips Design

The critical arguments made to Philips Design focused on the:

- Fluidity of innovation types in a 4/4 matrix
- Changes in the position of innovation types and its effect on the people working in these innovation types
- Lack of a discussion hub at Philips Design for storing the ideas that are not ready for the market
- Display of a model of the communication channels that would work with a discussion hub in place at Philips Design
- Defining how design could play an effective functional lead for Philips Design
- Proposing a change in the process that was mapped at the beginning of the study
- An overview of the methodology of the study

The presentation helped them grasp the content of the study and provide feedback.

8.4.2 Feedback from Philips Design

Philips Design provided my research with positive feedback that helped in revising my thought process. They readily agreed on a certain points that I made like:

- An explicit process leads to a better understanding of internal innovation process
- Internal communication channel plays an important role in establishment of a sound innovation system

- Existence of a gap between thinkers and practitioners within Philips Design RD&I team
- The changing environment influences the culture and invariantly the individuals leading to problems and increase of the gap between thinkers and practitioners
- Protecting delicate ideas has been a concern for Philips Design and they have been concentrating on competence development for the last 15 years.

The meeting with Philips Design led to a number of recommendations on the outcomes of the research. The most prominent one being:

- They wanted me to provide better explanation of why these organisations were chosen for a comparison with Philips Design. They recommended me to define each product cycle explicitly with their differences for each organisation as against Philips Design
- They recommended that instead of superimposing a technology curve such as Gartner's hype cycle over the three horizons of growth matrix, it would be more valuable to compare the cycles with the change in innovation culture within the organisation
- They recommended that I should highlight the role of design as a source of improving the narratives of the ideas and discussions in the organisation as one of designs biggest competencies
- They wanted me to highlight the importance of the internal cultural aspect and the influence of good leadership and governance in an organisation and the design team
- They wanted to understand my perception of a brand through my research highlighting the meaning of brand in my research. Do I mean brand in the traditional sense of branding or do I mean the essence of a brand?

The above comments made me re-examine my final data analysis and make the findings more robust and understandable. Philips Design is interested in knowing how organisations change from one market platform to another and how design plays a role in this transformation. They talked about Verganti's version of a discussion hub with external partners and wanted more information on the techniques used by other organisations to enable a continuous debate and discussion within the team. Though these requirements are very interesting they are beyond the scope of the current research and need further research on the topics.

8.4.3 Changes in Philips Design Strategic Process

It had been 2 years since I mapped the strategic process at Philips Design. The team had gone through fundamental changes in its strategic philosophy and process. Instead of incorporating three growth cycles now Philips Design concentrated on 2 horizons of growth; products and services now and products and services for the future. They removed the adjacent innovation/middle cycle from the 4/4 matrix causing a significant change in my personal thinking on the way organisations work. And I believe that this change is going to affect Philips Design adversely if it has not been taken based on the current Innovation Strategy.

The second important change was the decision to make probes redundant in the Philips Design process and moving it into the domain of marketing. According to Philips Design, marketing have confirmed efforts on similar research as probes within Philips. Philips Design has now started to concentrate on innovation at a local level and leaves global innovation for a more mature market.

Changes are inevitable for any innovation process especially with volatile environment surrounding organisations especially if these changes are not mere political decision.

8.5 Aligning Final Findings With Philips Design Feedback

The above final findings (section 8.3) and feedback from Philips Design were aligned against the source of evidence (Chapter 4, chapter 5, chapter 6, chapter 7). This identified the most prominent findings for the research (Figure 8.4).

Level of Importance	1	2	3	3
KNOWLEDGE COMPETENCY	**Role of a leader**	**Role of Design**	**Design and Brand**	**Process of Design Innovation**
	There is a big gap between thinkers and practitioners. Evidence: 1. Philips Design Literature 2. Chapter 4 3. Chapter 6, section 6.2.2 4. 1st & 2nd triangulation results, chapter 9. 5. Feedback to Philips Design, Chapter 9.	**Design has a role of styling the products.** Evidence: 1. Chapter 6, section 6.2.2, 6.2.3. 2. Chapter 4. 3. Literature. 4. 2nd triangulation, chapter 7.	**Design has to drive a companies resolution to being brand driven.** Evidence: 1. Chapter 4. 2. Chapter 8, Feedback to Philips Design. 3. Chapter 6, 6.2.3. 4. Literature.	**An explicit process is necessary for an effective design strategy.** Evidence: 1. Chapter 4. 2. Chapter 6, section 6.2.1. 3. 1st triangulation chapter 7. 4. Chapter 8, feedback to Philips Design. 5. Literature.
				Research and technology will be central to the organization in the future. Evidence: 1. Philips Design internal literature. 2. Chapter 6, section 6.2.2, 6.2.3. 3. 2nd triangulation.
				Organization must have a platform similar to Philips Designs 'marketing platforms' to their future direction in relation to their competitors. Evidence: 1. Philips Design internal literature. 2. Chapter 4. 3. Chapter 6, 6.2.1, 6.2.2. 4. 2nd triangulation.

Level of Importance	3	3	3	0
CREATIVE COMPETENCY	**Role of a leader**	**Role of Design**	**Design and Brand**	**Process of Design Innovation**
	Integration of Design into business poses a lot of challenges. Evidence: 1. Chapter 4. 2. Chapter 6, 6.2.1. 3. 1st triangulation. 4. Literature.	**Design could lead as a function only if they have an explicit process..** Evidence: 1. Chapter 6, section 6.2.1. 2. Chapter 4. 3. Literature. 4. 2nd triangulation, chapter 7.	**Design must bring out distinct brand identity for the organization. Design must be used as an agent that constantly reminds its customers about brand essence of the organization through its work.** Evidence: 1. Philips Design internal Literature. 2. Chapter 4. 3. Chapter 6, 6.2.3. 4. Literature.	
		Design team should have a well-defined role in the company. Evidence: 1. Chapter 6, section 6.2.2. 2. Chapter 4. 3. Feedback to Philips Design, chapter 8. 4. 1st & 2nd triangulation, chapter 7.		

Level of Importance	0	2	0	3
TEAM COMPETENCY	**Role of a leader**	**Role of Design**	**Design and Brand**	**Process of Design Innovation**
		Design has a role of styling the products. Evidence: 1. Chapter 6, section 6.2.2, 6.2.3. 2. Chapter 4. 3. Literature. 4. 2nd triangulation, chapter 7.		**An explicit process is necessary for an effective design strategy.** Evidence: 1. Chapter 4. 2. Chapter 6, section 6.2.1. 3. 1st triangulation chapter 7. 4. Chapter 8, feedback to Philips Design. 5. Literature.
				Research and technology will be central to the organization in the future. Evidence: 1. Philips Design internal literature. 2. Chapter 6, section 6.2.2, 6.2.3. 3. 2nd triangulation.
				1
				Well defined roles for all teams in the company. Evidence: 1. Philips Design internal literature. 2. Chapter 4. 3. Chapter 6, 6.2.2, 6.2.3.
				Training and guidance can lead a team to work. Evidence: 1. Chapter 4. 2. Chapter 6, 6.2.2, 6.2.3. 3. 1st triangulation.

Figure 8.4: Selection of the most prominent findings.

SUMMARY

This chapter highlighted the four phases of the study. The first phase highlighted the findings from the case study. The second phase highlighted the findings from the exploration of the three other organisations. The third phase, described the final outcomes preceding the final triangulation of data with the third party expert. The fourth phase gives a description of the feedback provided by Philips Design. The chapter concludes by introducing the most prominent findings for the research that will be taken up for discussion in chapter 9.

The chapter provides evidence to the fact that the research touched upon other aspects of design and its role in corporate organisations. These broad findings and their interpretation have added value to the study and enables a better understanding of the overall scenario surrounding design in the corporate environment. The next chapter will discuss the most evident findings that help answer the question asked in the research study.

DISCUSSION OF THE FINDINGS

CHAPTER NINE: DISCUSSION

The purpose of this chapter is to consider the data analysis in chapter 7 and there different applications. Also to explain final findings (chapter 8) and explicitly state how this study contributes to new knowledge. The study's broad aim is to: find tools that help establish design as a leading functional discipline in multinational organisations, help design drive innovation at the strategic level successfully and add knowledge to the theory of Design Driven Innovation by Verganti (2009). This chapter sets out to explain how this study has achieved these aims.

The study answers two basic research questions:

- Can design be established as a leading functional discipline in a multinational organisation?
- Can design drive a successful innovation process at a strategic level with the above stated role?

The analysis of the data from the research led to important observations being made that will be useful for the study of design. These observations will be studied at length in this chapter, but a focus will be put on findings that offer greatest insight with regard to the aims and objectives of the research.

The objectives of this chapter is to:

- Elaborate the final findings as described in chapter 7 with the relevant literature, making it clear how the findings validate and refute current design theories.
- Discuss the reliability of the findings and present them as robust conjectures as suggested by data analysis or conclusions drawn from these robust findings.
- Elaborate on the contribution of knowledge to the theory of Design Driven Innovation by Verganti (2009).

- Make suggestions for further research by considering the implications of the findings and by considering the scope and limitations of the research design, and
- Present the study's contribution to new knowledge.

9.1 Discussing the Study's Findings

The findings are a result of multiple triangulations and an action research cycle carried throughout the three years of the study as described in chapter 3. This section will describe each finding separately and discuss it in detail.

It took ten years for Philips Design to transform design from a contract-based[57] entity to a recognised function. Philips Design was able to do it by including design's contribution in their functional leadership programme (Chapter 4, Section 4.6.1). Design is confirmed to be a function in organisations only if they collaborate with other recognised functions at all levels of the decision-making process (Chapter 8, Section 8.3.1; 8.3.2; 8.3.3).

The next step is to enhance this role and turn the design function into a leading functional discipline. As a leading functional discipline design will be considered as one of the core entities generating value for an innovative and creative portfolio. This will ensure that design activities are integrated in the corporate mission statement. Philips Design is trying to achieve this by involving design in the 'value proposition and development programme' of Philips (Chapter 4, Section 4.2).

[57] Contract-based – Design is not a part of the organisational structure but works as an external entity. Design as a contract-based entity is called in to work on specific projects over a limited time period. The designers do not have any control on how the organisation works and no role in formulating strategy. It was only in 2008 that Man and Jung introduced the idea of design contributing to organisational strategy while being a contract-based entity. See: Man, K. Y. & Jung, M. J. (2008) Bottom-up design leadership as a strategic tool. *Design Management Review,* 19**,** 59 - 67.

9.1.1 Outlining the Findings

I begin by discussing the findings tested by the analysis that supports the role of design as a potential leading functional discipline in organisations. The findings confirm design's ability to lead as a functional discipline. Evidence gathered by exploring other organisations also suggests that design cannot lead an organisation alone and will have to share its leadership role with other disciplines.

I then shift focus to the most prominent reasons why design has not been able to engage at the functional leadership level in organisations. I do this by comparing the 4/4 matrix (Gardien, 2009, Renner, 2011, Cawley, 2010) (Chapter 1, Section 1.3) with Gartner's hype cycle (Linden and Fenn, 2003)(Chapter 2, Section 2.1.4c), change curve (Fisher, 2003) (Chapter 2, Section 2.2.1b) and diffusion innovation curve (Rogers, 2003)(Chapter 2, Section 2.2.1a), depicting changes in;

- the expectation of the people working in the three innovation cycles with respect to change in time and market,
- individual performance with respect to change in time and market, and
- the expectation of the outside market for the products that are released as well as internal expectation and adoption of new changes in relation to change in time and market.

My research brings out the influence of the above stated comparisons based on qualitative evidence collected at several occasions in the data collection and validation stage of the study. During exploration Company B stated the importance of time and market on its twin innovation process (Appendix 10, Question 3). Additionally, Company B also talk about engaging people in interacting with each other internally, highlighting the importance of the individual in creating a smooth environment internally in the organisation.

The above three comparisons are illustrated through conceptual graphical representations. The purpose of these representations is not to provide the exact ratio of the influence of theories over each other, but to visualize the conceptual relationships between them. The graphs try to depict how each theory demonstrates a gap between thinkers and practitioners but does not turn the conceptual model into quantifiable mathematical formulation, making this a very important area of exploration for further multidisciplinary research. The requirement being to work out the datum points for interrelating these theories and the scales of correlation between them.

As evidenced in chapter 2, scholars like Poole & Van de Ven (2004), Daft (2010), Handy (1985), Jick (1993) and Schein (1992) identify people, space/market and time as the most common denominator for innovation triggers. Additionally, Goodman et al. (2001), McGrath and Kelly (1986), Bluedorn & Dengardt (1988) have explored several perspectives of time in relation to organisational change but non have established any quantifiable relative conclusions yet.

Further, I lay out the findings that could support design in carrying out an innovation process while in the role of a leading functional discipline. These findings shed light on design activities within a team, presuming that the design team holds a leading functional role in an organisation. All the above-mentioned conclusions have been described below in separate sections.

9.2 Leading Functional Discipline of Design in a Multinational Organisation

The study's first contribution to knowledge is the definition of a leading functional discipline in the context of design as a discipline. Literature does not have a conclusive theory on functional leadership. The theory of functional leadership has evolved from its practice at the Royal Military Academy and was converted into a

theory only after 1990 by Adair (1990). Since then many have tried to extend its application into organisations but there is no single perspective for its definition. Functional leadership theory is still in its nascent stages of practice in organisations that have applied it in their work culture on a daily basis. The current research takes the functional leadership theory and tries to apply it to design and its leadership role. Hence, the current study defines the functional leadership of design as (Chapter 8, Section 8.3.1; 8.3.2; 8.3.3),

> *"Functional leadership of design, is established when the organisation and functions within the organisation, i.e.: technology, strategy, futures, and marketing, acknowledge design as one of the core entities generating value for the innovative and creative portfolio. Once design is recognised as a function, it needs an internal team aligned with the strategic decision making team. This design team should represent, and ensure, that all expected tasks aligned with the function of design are utilised properly and delivered in the right direction".*

Design as a functional leading discipline is a new phenomenon. The research confirms that design has the capabilities to hold the role of a leading functional discipline (Chapter 4, Section 4.6.1). The case study research of the practice at Philips Design was a source of data that confirms this theory. Nevertheless, evidence collected during exploration of other organisations suggested that design would have to share its leadership role with other functions at the core of the organisation's existence. At Company A, although design is used at a strategic level, it is not given the status of a functional leader (Chapter 6, Section 6.2.1b); rather Company A claims design to be a vital source of inspiration to the organisation (Chapter 6, Section 6.2.1c). Organisations that depend on technology like Company B & C use design as a support function and cannot see design holding a position of a functional leader unless it is shared with other functions like technology and research (Chapter 6, Section 6.2.2d).

Once the research established a consensus on the role design could take in an organisation my focus shifted to the realities of its practice. During the study I experienced a multinational organisation using design driven innovation (Verganti, 2009) at the strategic level to propose and develop future propositions in the hope to establish itself as a leading functional discipline. Despite having this opportunity that enabled design to put its capabilities into practice, for design to have a leading role was a big step beyond this. This research then questioned the way design worked in organisations. The time spent in defining, refining and mapping the innovation process at Philips Design led to the identification of important practices of design in a leadership role in this organisation, which were then included in the innovation process map (Chapter 1, Section 1.2, figure 1.6). These insights were confirmed further with triangulation and exploration of other organisations. This concluded in an agreement of existence of certain tools, when used together, would establish design as a leading functional discipline in the core of the organisation (for details on evidence for each tools refer to Chapter 8, Section 8.5, Figure 8.4).

As discussed in chapter 2, leadership requires the consideration of a number of characteristics like, a defined role, value addition, execution of power, budget allocation, asset generation, competencies, and team. On the other hand, Fayol (1949 orig. 1916) believes that leadership can be a consequence of need, habit, and value addition to the organisation. The recent push towards innovation and creativity by Brown (2009), Verganti (2009) and Cautela & Zurlo (2011) has led to the need for design to take the role of functional leadership and to achieve that, design needs to incorporate these essential tools.

- An explicit innovation process.
- Design to relate directly to brand essence.
- Communication of value created by design, and

- Corporate culture to support all endeavours of the design team.

9.2.1 Design Tool 1: An Explicit Innovation Process by Design

Organisations work in different ways. Chapter 2, described different types of innovation strategies that are used for competitive advantage like increasing product functions, styling, user centred innovation, and Design Driven Innovation. Which innovation fits into what business is a matter of strategic alliance amongst the functions and this decision takes years of experience, experimentation, and knowledge. Despite the variations in different types of innovation processes, an important aspect of a successful innovation is its explicit explanation.

The innovation process is not a rule binding strategy but a plan that keeps the team focused on the goal. The process must be used as a scaffolding to achieve the goals promised to the strategic planning team and provides building blocks in case of confusion. An explicit process with a predefined role for each of the team members would enable a better understanding for job requirements and remove ambiguity at process levels. Due to the fluidity of the innovation process the individuals get transferred into new roles and positions; forcing them to change the way they work. An explicit process would enable inducting employees and new entrants from other work environments to understand their new role.

Another important aspect is to decide which perspective to use in order to map and define the innovation process run by design. In the past, innovation processes have been made explicit using a number of ways, for example by the use of different disciplines (Kaplan and Norton, 2004) (accounts, human resource management) and software's like C/C++ programmes and SVM algorithm [39] (Simeon J. Simoff et al., 1998). Using these options would make it difficult to map a design innovation process keeping in mind that design involves the transfer of a range of implicit information and implicit knowledge. The current research promotes the

use of the design discipline to map its own innovation process, as it provides a visual and a descriptive identity to the map. Design through its visual description, identifies a number of ways an implicit source could be made explicit. Using designerly ways[58] (Saikaly, 2005, Yee, 2009) of mapping an innovation process makes it easy for the process to be distributed and communicated beyond the design team. To see the complete innovation process map of Philips Design go to chapter 1 (Section 1.3).

9.2.2 Design Tool 2: Design and Brand Equity

Design philosophy can make or break an organisation. It is design's responsibility to make it a good and aesthetically wonderful story (Gardien, 2008a). Organisations aspiring to use design as a functional lead put brand as their priority. This enables them to deliver a structure or a design model suitable to bring their vision to reality in terms of their products, advertisements, and communication. For example, Company A's corporate mission statement is 'connecting people,' whilst the mission of its design research aim is to increase the number of mobile users by 2 million, by the end of 2012. This mission statement aligns perfectly with their philosophy and has led Company A to expand in developing markets like India and Africa (Chapter 6, Section 6.2.1). In other organisations like Ericsson and IBM, design has the role of a support function. This role is based on design's ability to provide competitive advantage through the aesthetic styling of the organisations' products. When it comes to the heavy engineering organisations, design is called in at the end to make an engineered product appealing and attractive. In the case of

[58] Designerly ways – Creative mixing of processes, which are not dissimilar and lead to Innovative ways of conducting research. See: Saikaly, F. (2005) Approaches to design research: Towards the designerly way. *Sixth international conference of the European Academy of Design (EAD06)*. University of the Arts, Bremen, Germany. Using creative techniques to identify and capture tacit knowledge and communicating it effectively to designers and non-designer through a design research process. See: Yee, J. S. R. Capturing tacit knowledge: Documenting and understanding recent methodological innovation used in design doctorates in order to inform postgraduate training provision. Experiential Knowledge Conference, 19th June 2009 2009 London. London Metropolitan University.

Company B, design provides insights on material, colour of the fabric and creates live 3D models of the engineered ideas.

Irrespective of the role design plays in an organisation, all its activities should be aligned to increase the organisation's brand equity[59](Appendix 17 & 20). Literature evidences the huge role design plays in creating brand image and corporate identity. Design's role in enhancing the value of products through styling has been adopted and adapted in almost all organisations. Design has, in its most traditional role given form to products, which is an important image-building tool. Nevertheless, I support Marcus's (2002) view that design might not take into consideration all the other aspects of value addition but definitely has the most important role in the life span of an organisation. Organisations trying to promote a brand driven innovation strategy have been seen to use design as a key driver. Abbing (2010) supported this by stating that design is essential to execute this strategy and instils in the strategy the design skill that helps resonate a clear brand message throughout the organisation internally. Philips was seen using design to develop a common understanding of the brand throughout its internal structure. However, other organisations that were explored used design in the most traditional sense of new product development, described by Olins (1978) as the traditional way of including design into creating brand identity for an organisation.

9.2.3 Design Tool Three: Design Value Communication

Data triangulation (Appendix 8, Question 6) shows that the value created by design in an organisation is not communicated to the wider team, leading to a lack of understanding and distrust for the design team. It's evident that design is not given the same respect as other functions. The lack of literature supporting this fact and

[59] Brand Equity – Brand equity is a marketing term that highlights the value of a brand name. It based on an idea that customers would buy more products based on the brand name rather than spending money on a product from a less famous brand. For example Philips has brand equity in light bulbs and customers would pay more for Philips light bulbs rather than any other brand because of the trust they bestow on the brand. See: Kapferer, J.-N. (2004) *The new strategic brand management: Creating and sustaining brand equity long term,* London, Kogan Page Publishers.

the practice of design being separate from other functions in organisations have made it important for design to have a dedicated communication channel to advertise its value addition.

Design activities need to have sustainable and well-established channels of communication between all the other functions involved in the strategic management process and the innovation process at all levels. Most organisations that were explored were less motivated to put design in connection with their strategic process and the ones that did, struggled with a good communication channel. This led to a lack of involvement and the loss of communication and consequently the loss of many good ideas.

Design value can be communicated within the organisation in many ways, like holding informal presentations, exhibitions, involving other employees to be part of the design process and building a process that collaborates and establishes strong networks throughout the organisation structure. These networks can be established when an explicit process is in place and concrete communication channels have been predefined. This helps to develop better and more complex connections for the future without jeopardizing the position that you have established by the process.

9.2.4 Design Tool Four: Supportive Corporate Culture

Culture is a fluid characteristic formed from the understanding, belief, actions and convictions of individuals to generate a distinct identity (Schein, 1992). Generally, combining different individuals in a group brings out new characteristics of culture that keep on changing. This evolution is caused by the transformations of each individual's understanding, beliefs, actions and convictions to form a common action for the group. Literature states that corporate culture has a major influence on the way people work and vice versa (Cautela and Zurlo, 2011). Organisations

train employees in order to maintain a work culture suitable for all, nevertheless the internal changes and the effect of these internal changes on the individual creates a challenging atmosphere to manage.

To be a leading functional discipline design has to align its culture with other functions involved in strategic decision-making and vice versa. This adds another challenge to the work culture of the organisation as different ways of thinking and working collaborate to meet a common goal. Design faces political resistance from other disciplines and is not trusted enough to be explored to its full potential (Appendix 10 & 17). One of the causes for this distrust is the lack of awareness by other disciplines about the value generated by design (Appendix 11, explanation for question 6).

All the above stated conditions (Section 9.2) can be implemented with the support of a culture that helps design explore its capabilities. Organisations have to facilitate a culture of acceptance to design and create a need to involve design in all decision-making, at any level. Needless to say, with less political resistance design could work on issues related to building knowledge, creating new ways of working and the communication of value that would benefit organisations as well.

9.3 The Corporate Gap

The study also found reasons why design has a problem in being a leading functional discipline even when provided with a strong platform, as seen in case of Philips Design. The most prominent reason found was the existence of a gap between the thinkers and practitioners in the team. There was a significant gap of knowledge, thinking, time and perspective between the thinkers who were involved in finding viable options for the future and practitioners who were focusing on defending the current core business.

Literature describes the reasons for the existence of the gap to be, the resistance of individuals to accept change (Fenn and Raskino, 2008), the ability of the team to adopt new cultures (Schein, 1992) and other behavioural aspects of human beings (Rogers, 2011). Evidence shows this gap exists in all teams and in every organisation. Nevertheless, this study focuses on the effects of the gap on the design function.

The research has discovered certain reasons why the gap exists, particularly in relation to the design team. These influences are

- external factors that affect and force the internal culture to change (Fisher, 2003),
- acceptance of the cycle of the current culture by individuals in the organisation (Schein, 1992),
- old customs, rituals, and activities associated with the native organisational culture (Deetz, 2003),
- relationships with other identities and internal agents of influence within the new culture (Deetz, 2003, Peters and Jr., 2003),
- relationships between dominant and weak cultures in organisations (Foucault, 1977, Goleman et al., 2002) and,
- how leaders use their power and knowledge to understand and manage these cultural challenges (Gardien, 2008a).

Conversations with other organisations in the study confirmed the evidence provided by literature on the existence of a gap and its influences. This made it imperative for me to draw conceptual diagrams to visualise the relationships between these influences in context of horizons of innovation/innovation cycles. This has been done in sections 9.3.1, 9.3.2 and 9.3.3.

In Philips' Design practice, there was evidence of three horizons; Horizon 1 being run by practitioners who work on projects with a short life span of 0-2.5 years and Horizon 3 run by thinkers who work on creative future business options from 10-30 years. A lack of ownership exists for Horizon 2 where emerging businesses is created from 3-10 years, as shown in figure 9.1. The data highlighted that the gap between the way of working and understanding between the thinkers and practitioners was created because of the differences in priorities related to innovation, time, nature of innovation and internal culture (Appendix 8, Explanation of Question 3).

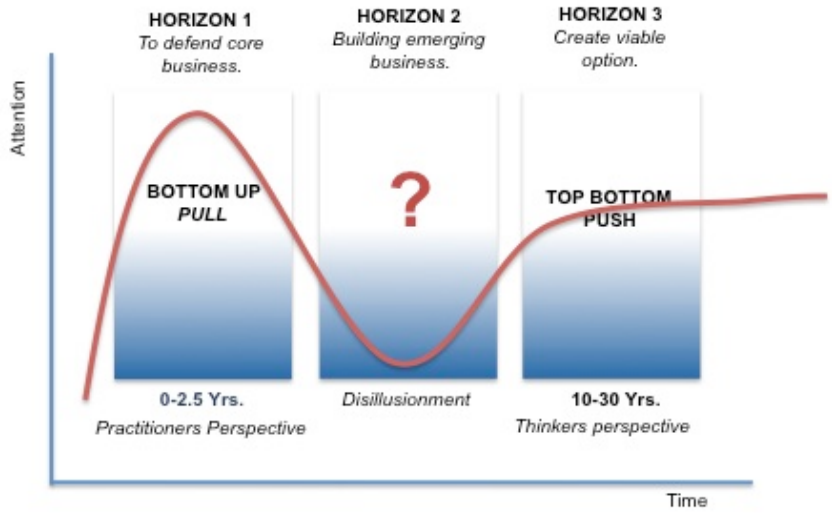

Figure 9.1: Explaining the gap (evolved from Alchemy of growth)(Gardien, 2008b).

The above-mentioned horizons have teams and these teams work on three different innovation cycles as suggested by data analysis (Figure 9.2). Figure 9.2 shows, H1 innovation cycle closely related to horizon 1 involved in incremental innovations, H2 innovation cycle closely related to horizon 2 involved in adjacent innovations and H3 innovation cycle closely related to horizon 3 involved in breakthrough innovations through its 4/4-innovation matrix (Chapter 1, Section 1.3). The existence of these three innovation cycles was confirmed from attending conferences (Appendix 1).

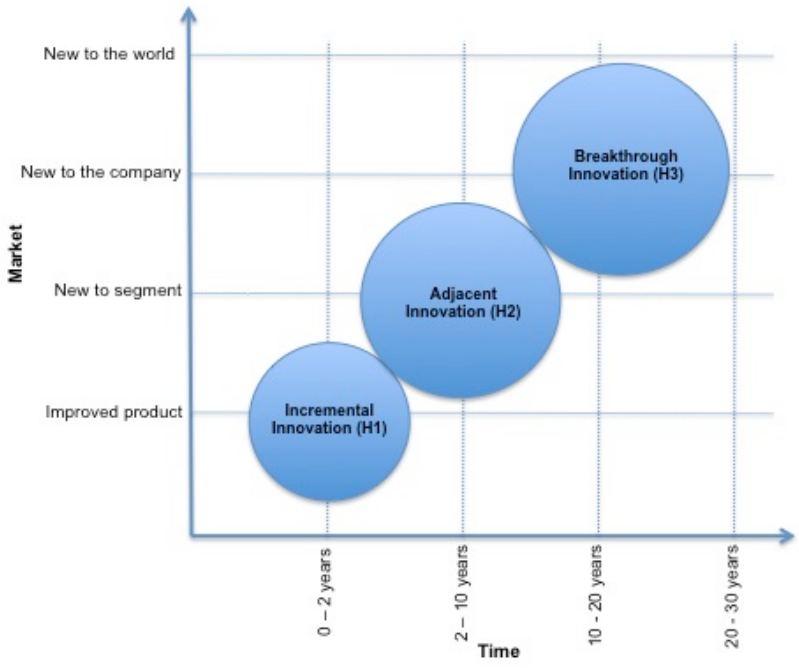

Figure 9.2: The three Innovation cycles (source:(Cawley, 2010, Gardien, 2008a, Gardien, 2008b, Moore, 2005)).

The present scenario for Philips Design and organisations explored in this study poses a number of difficulties due to the changing nature of the working environment. The research identified reasons for design being plagued with the problem of the gap between thinkers and practitioners through three conceptual comparative graphical representations. These comparisons include:

Comparison 1: In relation to the movement of the innovation cycles over time in the market and the changes in the expectation of the people working within these different innovation cycles.

Comparison 2: In relation to the movement of the innovation cycles over time in the market and its relationship with the performance of the individual working within the innovation cycles.

Comparison 3: In relation to the movement of the innovation cycles over time in the market and the changes in the expectation of the outside market for the products that are released in each innovation cycle. It also shows the relationship at the level of adoption of a new culture by the individuals working in these three innovation cycles.

These comparisons are further explained in the following sections.

9.3.1 Comparison 1: Change In Individual Expectation Within The Innovation Cycles

Mergers, layoffs, and other challenges faced by organisations in the 21st century make it difficult to capture and store ideas and competencies in the changing environment (Weick, 1995). Organisations invest most in research and development. It is seen in the cases of Philips, Company A's Research Centre and the Customer Research Centre at Company C, that their innovations are triggered by the research and development involved in state of the art inventions, experiments and intellectual property acquisitions. Such organisations which are involved in technological innovation base their understanding of the external market on Gartner's Hype Cycle (Fenn and Raskino, 2008). As shown in chapter 2, Gartner's Hype Cycle works on two factors, human nature and the nature of innovation. This research superimposes Gartner's Hype Cycle on the 4/4-matrix to show the influence of another factor, the time. As evidenced in chapter 2, scholars alike Poole & Van de Ven (2004), Daft (2010), Handy (1985), Jick (1993) and Schein (1992) identify people, space/market and time as the most common denominator for innovation triggers. Additionally, researchers like Goodman et al. (2001), McGrath and Kelly (1986), Bluedorn & Dengardt (1988) have stated several perspective of time in relation to organisational change but non have established any quantifiable relative conclusions.

A relationship has been created between the cycles of innovation/horizons and Gartner's Hype Cycle. The Hype Cycle is used to judge the life expectancy of a technological trigger or a new idea, which is transformed into products and services. Similarly the 4/4-matrix is used to judge the cycles of innovations/horizons an organisation is involved in, including the people working

within these innovation cycles. The graphs explained in the coming sections try to show three important features:

- New innovation cycles are created as time moves forward.
- Horizon 1/Incremental Innovation cycle dissolves as time moves forward.
- New Gartner's Hype Cycle can be created at the point of any Horizon/innovation cycle.

For details on construction of the graph please refer to appendix 21.

9.3.1a Explanation of the Graphs

The three-dimensional graph used by the research is a combination of two separate theories; the first one being the 4/4 matrix, which shows the innovation cycles/horizons that organisations follow to judge their position in the external market and the second is Gartner's Hype Cycle. Figure 9.3 shows the most traditional scenario where multiple technological triggers are generated in H1 innovation cycles leading to generation of a Hype cycle. This hype cycle signifies that the ideas generated in the H1 innovation cycle would reach their 'peak of inflated expectation' as time moves forward. These ideas would establish there 'platform of productivity' in the next 30 years presuming establish a strong market and maintain a high expectation with its consumers.

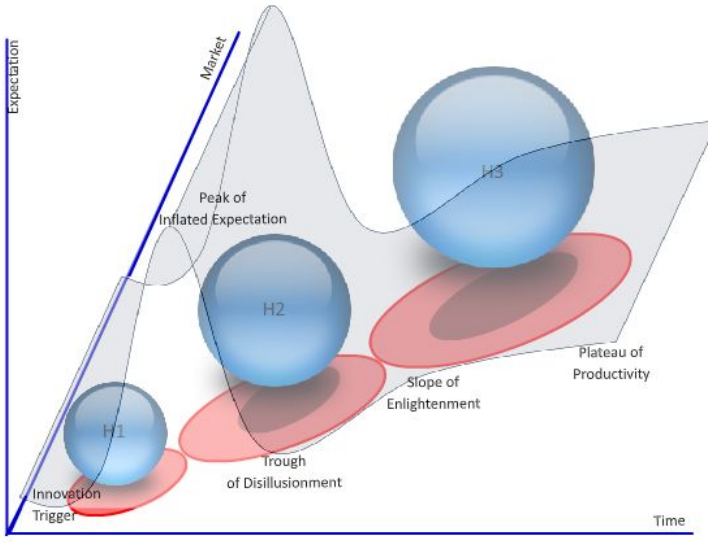

Figure 9.3: Three-dimensional graph showing the relationship of innovation type with Gartner's Hype Cycle in (x, y, z) where x is time, y is expectation and z is market.

Figure 9.4 illustrates another likely scenario of an innovation trigger being generated as a H3 innovation type. This will lead to the beginning of a new Gartner Hype Cycle. In organisational practice, multiple hype cycles can be created simultaneously at a point of time whenever new ideas are generated at any innovation cycle.

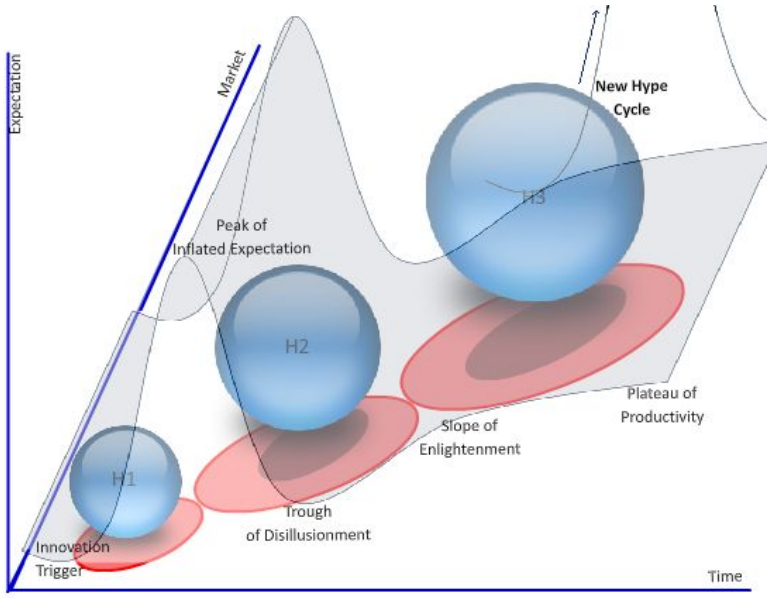

Figure 9.4: Three-dimensional graph showing the occurrence of a new Gartner's Hype Cycle.

Figure 9.5 shows a situation where, as time moves forward, the innovation cycles (H1, H2, and H3) shift in the external market space leading to a change in ideas, product and people within these cycles. Hence, with time, H3 moves to a low market space and a lower expectation level, in comparison to its previous position. Similarly, the H2 innovation type shifts to a lower market space and higher expectation in comparison to its earlier space, which was high in the market space but very low where expectation is concerned. And the H1 innovation type dissolves in time leading to a decline in innovative ideas in incremental products.

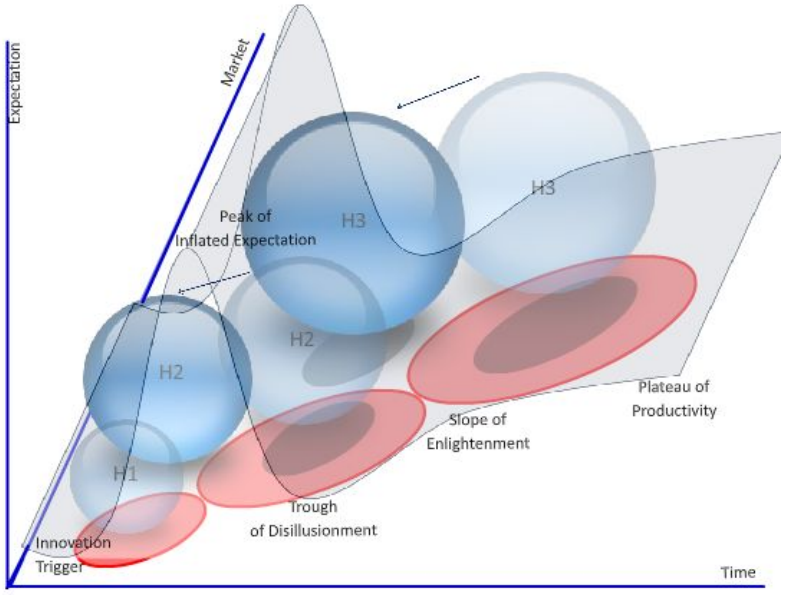

Figure 9.5: Three-dimensional graph showing the change of Innovation cycles with the change in time.

Figure 9.6 depicts a new series of H1, H2 and H3 being created with time from figure 9.5. The graph indicates that changes in position of the innovation cycles leads to the shifting of projects and people working within these cycles.

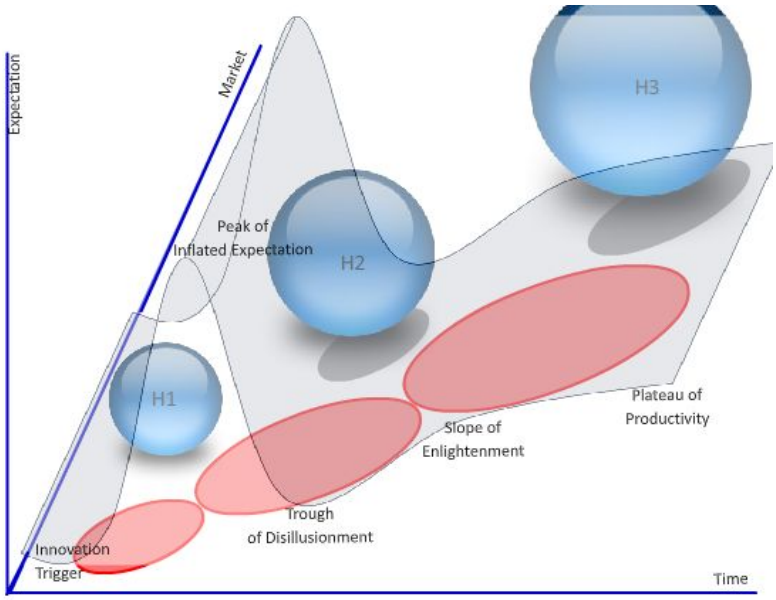

Figure 9.6:Creation of new Horizons/Innovation cycles in time.

Possible options in the form of products realised today for the market in the next 20 years, will become core business options in the span of 30 years. And core business

propositions of today will disappear in time. These shifting roles within the horizons/innovation cycles causes confusion as time passes. These ever changing innovation cycles/horizons in time, change the structure of the process being followed at each of these innovation cycles; it transfers ideas, knowledge and competencies into different innovation cycles and it changes customer's expectations towards products and services, ultimately leading to major alterations in the structure and culture of the organisation internally and externally in the long run. This also leads to changes in the roles of the employees within the innovation cycles that require new training, grooming and induction of new entrants.

Generally in organisations, practitioners manage H1 type innovations; the thinkers manage H3 type innovations. The management of H2 type innovation is debatable. Philips Design tried to solve this problem by putting individuals with mixed competencies in each of the innovation cycles (Appendix 8, Question 10). This solution has not been able to solve the problem. This change in the position of innovation cycle with time and the shuffling of people and their competencies within the innovation cycles is one of the many causes of the gap that exists between the thinkers and practitioners.

9.3.2 Comparison 2: The Corporate Culture Change

Change is at the core of innovation. Previously we saw how time, expectation, and market change creates the gap between thinkers and practitioners in an organisation. These changes have a cascading effect and they have the ability to alter the smallest elements of an organisation. In an organisation individuals are the most affected due to any small changes. Individuals working in teams in any organisation deal with challenges coming from different directions. They are under constant pressure. This is made clear in the change curve by Fisher (2003). Even a small alteration in the work culture/environment leads to the beginning of a new cycle of change, which puts individuals under a lot of pressure. Evidence of

individuals affecting culture and vice versa was seen during then 2nd triangulation process when Kyffin (Appendix 14, Question 10, p. 347) remarked,

> *"...Human beings in a culture cant see their own froth because they are in it; they are an element on it. So yes if you throw a foreign body into that culture it would affect it positively/negatively but certainly affect it and therefore create a new, changed culture..."*

In organisations, individual behaviours govern the success or failure of a process. The research has tried to depict the connection between individual performances and human emotion change as one of the reasons for the gap between thinkers and practitioners. This is depicted by the comparison between the change curve with respect to the innovation cycles H1, H2 and H3. Axonometric graphs have been used where the x-axis represents time, the y-axis represents performance, and the z-axis represents the market.

For details on the construction of the graphs please refer to appendix 21.

9.3.2a Explanation of the Graphs

Figure 9.7 superimposes the two theories; first, the change curve and second the 4/4-matrix involving the innovation cycles. The graph illustrates the fluid identity of the innovation cycles creating a constant state of change (as seen in figure 9.4, 9.5 and 9.6). As we move in time, innovation cycles shift and change their position. This change is predominantly internal, and puts immense pressure on individuals. As the innovation cycles are moving in respect to time, each individual within these innovation cycles deals with multiple changes prompted by change in the internal culture. These adjustments lead to the beginning of a new 'change adaptability' curve. Figure 9.7 shows that even a slight change in the work environment or culture could lead to changes in performance. Even if an innovation type like H2 cycle moves towards the current market position, the

unstable condition of those individuals working in this cycle leads to a possibility of low performance.

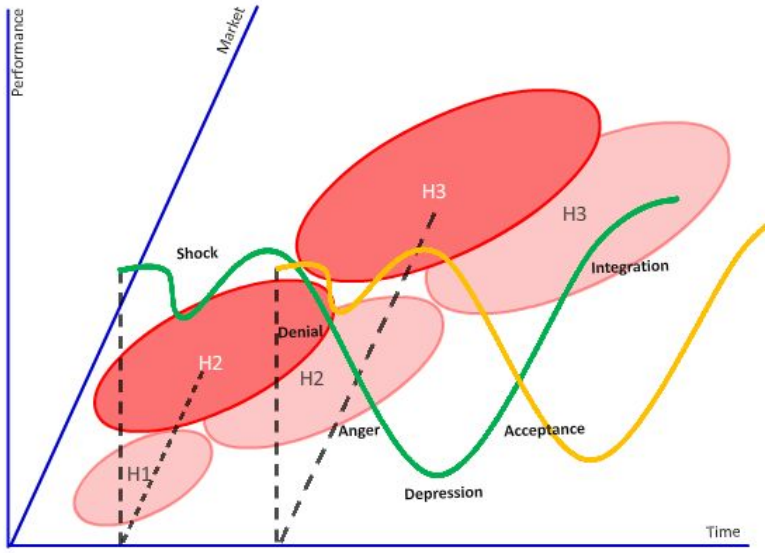

Figure 9.7: Comparison of the axonometric graph with the change curve.

The important aspect to note here is that practitioners are the owners of H1 innovation cycle, which gets dissolved as time moves forward, leading them to be in a constant cycle of change. Contrarily, the thinkers are initiators of most changes and own the H3 innovation cycle, hence causing themselves and the H3 innovation cycle to be least affected by change. The H2 innovation cycle having mixed ownership of thinkers and practitioners is also in a constant state of change as the design team working in this cycle needs to collaborate extensively with other stakeholders to maintain a balance of core businesses and creating new businesses for the future. Additionally, the H2 innovation cycle integrates ideas, products and people from the H1 innovation cycle that dissolves every 2 years and the H3 innovation cycle that is unable to roll out new products in the market leaving very a low possibility of a stable mind set for its workers. Hence, an individual coping with change in an unstable internal culture is the second most prominent reason for the gap to exist between thinkers and practitioners.

9.3.3 Comparison 3: Effect of Corporate Changes on Adaptability Within Teams

Earlier we saw how change in corporate culture affects individual's performance. The research also shows that corporate culture affects teams that are working in each of the innovation cycles/horizons. Each team needs a separate game plan to adapt to these changes. This is done in businesses by using the innovation diffusion curve (Rogers, 2003). The innovation diffusion curve depicts how a new innovation/business change or marketing promotion is adopted based on the different decision-making, activities, impacts and recognition of problems by different clusters within and/or outside an organisation.

For details on construction of the graph please refer to appendix 21.

9.3.3a Explanation of the Graphs

Figure 9.8 illustrates the superimposed diffusion curve against the innovation cycles/horizons. Two conclusions are drawn through this comparison. The first conclusion is in the area of adaptability of changes by the team working within the innovation cycles H1, H2 and H3. First, it is seen that the H1 innovation cycle has the shortest span of adaptability due to the fact that it dissolves as time moves forward. Practitioners have the ownership of the H1 innovation cycle and shifting them into new horizons and with new projects to work on makes it difficult for them to adapt to any change. Second, the H3 innovation cycle is involved in forecasting the trends and making proposals for the future and is predominantly owned by the thinkers. The team working in this cycle goes through changes; nevertheless the thinkers themselves initiate most of these changes. Hence, the time span and pressure of adaptation to the changes are less than the ones in the H1 innovation cycle. Third, the H2 innovation cycle is responsible for the most innovative products and the teams working within this cycle are most affected by changes. The team in the H2 innovation cycle has a balance of thinkers and practitioners working and it is seen that teams in the H2 innovation cycle have a

high probability of adapting to new changes. There is a vast difference in the level of adaptation to change among the teams working in the innovation cycles H1, H2 and H3. This difference adds to the gap between thinkers and practitioner but also creates a gap of knowledge and communication between innovation cycles.

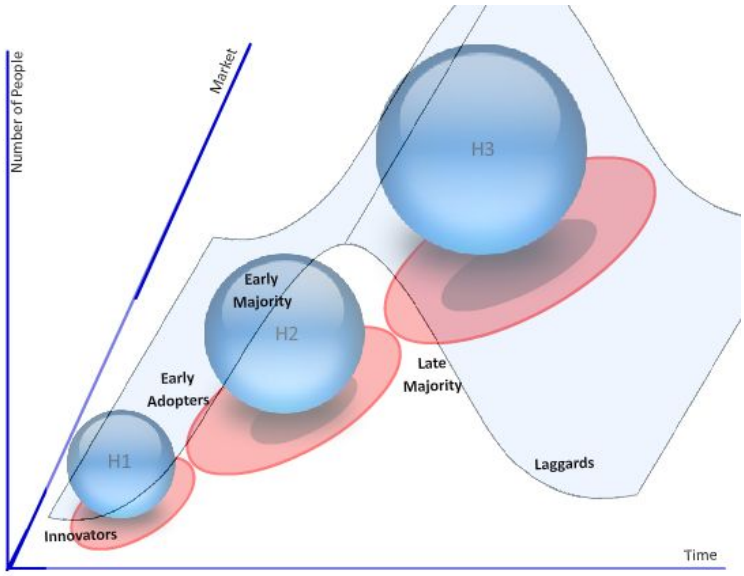

Figure 9.8: Three-dimensional comparison of innovation change and adoption of these changes by three different teams working in three different innovation cycles.

The second conclusion is drawn about the consumer's reaction to the innovative products and services being rolled out from the innovation cycles H1, H2 and H3. First, with new product innovations being accepted in the market, we see that H1 remains in a market space that is predominantly composed of early adopters i.e. consumers who are ready to buy new products that come in the market. Second, products developed in the H2 innovation cycle dominate the early majority and late majority adopters despite the change in its position over time as shown in figure 9.9. This happens because the consumers perceive products in the H2 innovation cycle as being more innovative in comparison to the H1 or H3 innovation cycles.

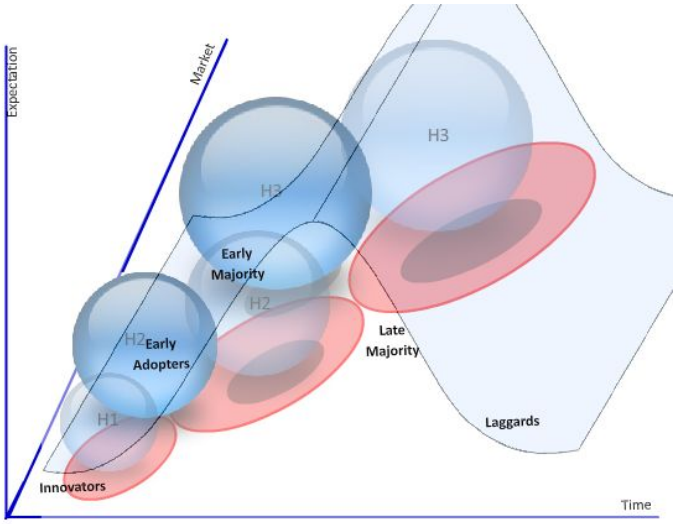

Figure 9.9: Three-dimensional comparison of new product rollout by the three innovation cycles and its adoption by the market.

The third conclusion is that, the H3 innovation cycle does not roll out breakthrough products and services to the market. This is because these innovations are meant for the future and organisations associate breakthrough ideas with high risk and high cost. Most H3 innovations are rolled out within the H2 innovation cycle. Despite H3 having the highest adopters to market, most organisations do not have the facilities to engage in making products that are completely new to them as well as the world. This means that the H3 innovation cycle, which is predominantly handled by the thinkers, can only be a source of inspiration to organisations, unless the ideas are translated and transferred to the H2 innovation cycle to be rolled out in the market. Figure 9.10 shows H3 outside the adoption curve.

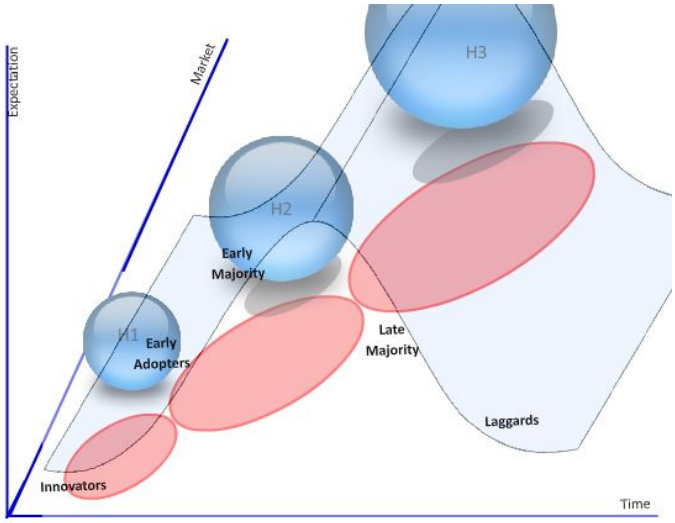

Figure 9.10: Three-dimensional graph showing new innovation cycles H1, H2 and H3 forming against the Rogers adoption curve.

The comparison between the 4/4-matrix and the diffusion curve shows the conceptual relationship between the rates of adoption by the teams working in the three innovation cycles. In addition, it illustrates the rate of adoption by the consumers of the products that are rolled out by these three innovation cycles. The comparison concludes that the H2 innovation cycle has more resilience towards change and has an ability to motivate the market to adopt products released by them. Whereas, H1 and H3 innovation cycles are surrounded by difficulties in relation to changing time and the lack of an established market.

Having identified the three most prominent reasons for the gap between thinkers and practitioners, the research went about finding tools that the design function could use to carry out an effective innovation process at the strategic level while being a leading functional discipline.

9.4 Design Activity

The findings confirm a number of tools that the design function could benefit from in their activities while working in an organisation. These techniques might help the design function to maintain a strong base in the functional leadership

programme and run a smooth innovation process while being a leading functional discipline.

The research was able to identify three dimensions of design. These dimensions highlight design competencies that are required to establish it as a leading functional discipline in an organisation (Appendix 15, Question 12). They are:

- A creator/designer in the most traditional sense – making things, using tacit processes etc (Fujimoto, 1990).
- A connector - individuals who can connect different facets of an organisation. They are not necessarily designers but have a creative mind to synthesise the information and add value to the multidisciplinary nature of the innovation cycle they are working for (Brown, 2009, Schmitt et al., 1995).
- The explorer – developing proposals that have not been thought of before. Generating options for the future (Martin, 2009, Buganza and Verganti, 2006).

The research identified the competencies of a leader for the design function. A leader for a design functional team at the strategic level of an organisation is an individual who can establish all the three dimensions of design competencies successfully in the length and breadth of the organisation's strategy and innovation cycles/horizons. The research concludes that the design functional team needs to have a multidisciplinary structure. It confirmed that design innovation is not about 'designers' (Appendix 15, Question 9); instead it is about the individual and the creative capabilities that an individual brings into the function of design. Lastly, the research pushes the importance of an explicit process to facilitate a platform to develop new competencies for the function of design. These tools have been suggested by the findings but they need to be put into practice by an organisation and tested to identify their effectiveness.

9.4.1 The Three Dimensions of Design

Certain experiments about the way designers work lead us to believe that they use intuition as a tool to make connections between unrelated objects (Brown, 1998). This accepted belief provides the basis in this research for three broad roles design can take in an organisation, depending on their design/creative competencies (as shown in chapter 8, section 8.3.1), and they are:

Creative role of design – This is the most traditional form of design known to the discipline. Design incorporating both designers and non-designers in a creative process to shape solutions to real world problems. This creative ability to transform objects into valuable expressions of themselves for the user is one of the most valuable characteristics of design (Borgmann, 1995). All organisations, big or small, consumer or heavy industrial goods, use this aspect of design in their corporate profile. Providing shape and aesthetic characteristics to objects and making them desirable is the most prominent role of design. Along with having the creative competencies required to accomplish this job, individuals also require a good understanding of the user and the market and good communication skills to interact effectively at a cross-functional level.

Connective role of design – The second dimension of design, which is less explored but plays an important part in enabling design to lead strategic innovation processes, is the competency to connect. Marcus (2002) claimed that design uses intuition to find solutions. The characteristic of design being able to connect and link multi-dimensions and scenarios enables them to extract distinct principles for the solution to the problem. Design's ability to connect also gives designers the power to envision scenarios that are not possible to be envisioned by any other function. For example, technology is taught to provide solutions to a complex problem, where the emphasis is to understand the phenomena at hand. Whereas,

design uses informal processes, similar to inventors, to generate possible solutions to problems without actually solving the problem first (Potter, 2002).

The competency of connection in design is useful in sustaining innovation and growth and adding new segments in the product portfolio or a new product to the organisation. With the full exploitation of this role, organisations could enable a sustainable dialogue between all-important functions in the organisation and enhance the productivity and understanding of the possible directions to enhance the creative portfolio. This competency will mainly be useful in the H2 innovation cycle where design teams are seen to have a lack of ownership.

This characteristic approach of design is useful in connecting the activities carried out by their team with that of other teams and functions in the organisation (Brown, 2009, Potter, 2002) and as seen in the innovation map in the Philips case study (Introduction, Section 1.3). Unfortunately, this role has not been explored in most organisations due to the lack of inclusion of design in the core culture of the organisation. The organisations that are able to integrate design into their core culture find themselves in a challenging political situation as design collaborates with other functional leading disciplines, and competition for power and influence ensues.

Explorative role of design - The last creative/design competency is the competency of exploring. Design has the ability to explore untouched ground through creative methods. This aspect of design has not been explored by organisations and the ones trying to explore it are met with the challenge of budget allocation, acknowledgment of the origin of ideas in the innovation portfolio and resistance from other functions.

The exploration competency provides a platform to indulge in breakthrough innovations. It involves having close communication between the R&D, technology and the design innovation team. The design team works on creating

proposals, which are primarily used to find consumer insights and undertake socio-cultural research in the real world. These design experiments provide the organisation with a chance to anticipate changes in the world. These observations are incorporated into product and service ideas, which are further, explored and give, rise to solutions that are new to the world and are the essence for new growth in organisations.

Verganti (2008) talks about an exploratory aspect of design that accomplishes breakthrough or radical innovation . The essence of this talent of design is to enable a good communication channel at the corporate level and allow design to play with organisational assets in the same way that other function such as technology, R&D, and marketing.

9.4.2 Role of a Design Leader

This research went through a lot of changes in the concept development of leadership. Philips Design is predominantly an organisation working under Dutch culture and is an epitome of cooperative strategies (Nickerson, 2000). They believe in the united effort of all and the existence of a leader is not visible in decision-making processes. Further exploration of the empirical evidence showed that leadership played an important role in successfully delivering design innovation, establishing communication with other functions and enabling sustainable design participation at a strategic level in the innovation process. The creative decision-making was left for the team players to debate and synthesise the best, through a series of meetings and workshops.

By exploring other organisations, many other aspects of a leader's role surfaced. Company A believes in the leader whose role is that of a facilitator and who juggles jobs between the team. For Company B a leader is the ultimate authority that has the decision making power. For many other organisations a leader is

involved in engaging the employees for internal idea generation by inspiring and motivating them to collaborate with the teams from around the organisation. However, the big question here is; who is a leader that can establish all the three dimensions of design competencies successfully in the length and breadth of the organisation's strategy?

This research concludes that a leader's role is not just a control factor but also the glue that keeps the design team close to the organisational structure. A leader must enable a platform for positive communication and knowledge sharing between the functional design team and the organisation. In practical circumstances the role of a leader in a design team is to enable a dialogue between design and other functions for an opportunity to communicate the value of design, to share ideas and review performance and help in sharing value and generating awareness, consequently in gaining respect (Appendix 17, Answer 13; Chapter 6).

To get design involved in strategic innovation planning, the leader has to go through a series of critical debates with the board and the top executives of the organisation. Hence, the design leader should be aware of his/her team and their work, and should have a vision for design. To lead a multidisciplinary team, the leader must be aware of existing competencies, and also have a plan to develop new competencies and capabilities in the future. Only visionaries have the ability to see a future in the design driven innovation approach. Such visionaries must have a sound reasoning of taking on board people with the right capabilities (Appendix 17, Answer 9).

9.4.3 The Leading Functional Discipline Team of Design

The evidence confirms that design activities need to be done by a team that is multidisciplinary. As seen in earlier discussions all the three levels of innovation cycles go through a number of changes and the individuals involved in these

innovations cycles succumb to pressure of multiple changes, leading to weak communication channels between design and other functions. Having a multidisciplinary team involved in the strategic decision-making process enables a smoother communication between sub-functions and other teams across the innovation decision-making process.

When individuals coming from different perspectives are involved in debate and discussion, creativity and problem solving is improved (Godbout, 2000). Multidisciplinary design teams enable a better understanding of the problem and when this team co-chairs strategic level innovation governance, the solutions that are generated include value from all functions and perspectives, making it easier to convert the ideas into reality. Collaboration within the cross-functional members of the design team leads to better alignment of knowledge, competencies and intellectual property and enables faster decision-making.

9.4.4 Competence Development for the Leading Functional Role of Design

Acquiring functional leadership is closely related to the capabilities and competencies that a team acquires in its years of experience and working together. Philips Design has tried hard to iterate its competencies at the three levels of innovation strategy. Other organisations accept the role of competencies but refuse to share them with external sources because of their effectiveness in providing them with competitive advantage (Barney, 1991).

The first step to an effective competency management is acknowledging its own collection of knowledge, skills, abilities and other characteristics that comes to an organisation with its entrepreneurs, customers and technology (2009). Existing competencies can be recognised by mapping the innovation system that also helps in mapping their competencies or the lack of them.

It is wrong to put the sole responsibility in the hands of human resource managers for managing competencies. In the case of small teams, the activity of identifying core competencies lies in the hands of the leader of the team because the ultimate power of facilitation of work lies in his or her hands. The leader has the power and the vision to hire people with the right competencies and record existing competencies in the team as well.

The next important job is to generate competencies. The process of generation of new competencies comes with new projects, ideas and challenges. As and when the team finds new challenges, the process used to solve the new problem must generate new competencies and new ways of working.

Design activities identified are;

- the three dimensions of design,
- the leadership qualities of a design leader,
- the design team at the leading functional level, and
- competency development by design innovation process

In order to confirm their effectiveness these activities need to be tested in real practical environments.

9.5 Contribution to the Theory of Design Driven Innovation

Chapter 5 identified four gaps in the theory of Design Driven Innovation by Verganti (2009) when compared to its practice at Philips Design. The study supports the theory of Design Driven Innovation and confirms that the identity of the design team at the strategic level of the organisation should be multidisciplinary (Section 9.4.3). The team must incorporate individuals who have the skills to create, minds to synthesise and ambition to explore through socio-cultural trend research (Section 9.3.1).

The gaps that were identified were that the theory did not support the organisation in terms of the application of Design Driven Innovation for various organisational structures, types of leaderships or cultures. The research finding on the other hand has incorporated the influence of internal cultural changes on the design team and the gap between the thinkers and practitioners as well (Section 9.3.1). These internal changes signify that the role of interpreters changes with time and must be aligned to the Design Driven Innovation process with the help of an explicitly defined process.

The research has confirmed that a user-centered approach is practiced in organisations and will not loose its importance. Hence, design has to develop competence to support strategies carried out by its stakeholders within the Design Driven Innovation process. This can be possible with the use of a multidisciplinary design team, aligning processes of the stakeholders with the Design Driven Innovation process and developing the competence of design to 'connect' different areas. The research confirms that the 'connection' competence of design activities is the least explored in organisations and could be an important area where interpreters could contribute to Design Driven Innovation (Section 9.4.1).

Finally, design should be an established leading functional discipline, in order for the Design Driven Innovation process to make a contribution in a multinational organisation like Philips. A Design Driven Innovation process can be quantified and confirmed to be adding value to the organisation, if it is developing strategy at all levels of the three innovation cycles. The research identifies three important competences that design has to develop and practice in an organisation, that is the competence of a; creator, connector and explorer. The role of interpreters provided by the theory of Design Driven Innovation can be applied at all levels of the innovation cycle providing innovative meaning to products, irrespective of them being radical or not. This is necessary because in practice organisations like Philips

are not willing to risk releasing radical ideas into the market. These organisations prefer to wait till the experts guarantee that the market is ready for the idea.

9.6 Research Implications

This research investigates tools that could establish design as a functional leading discipline and help design drive innovation at the strategic level to lead an innovation strategy in a multinational organisation. The empirical evidence confirmed the establishment of design as a leading functional discipline in multinational organisations like Philips. But it also clarified that design could only hold this position if it shares it with other functions in the organisation. It was seen that design driven organisations like Philips Design had provided design function with the platform to lead nevertheless design was incapable of holding a leading position and was plagued with problems. One of the reasons for the inability of design to establish and hold its position as a leading functional discipline was found to be the existence of a gap between thinkers and practitioners and the research provides reasons for the existence of the gap.

The research study has also confirmed that design can be a functional leading discipline under the condition that it co-chairs the responsibility with other functions and develops an explicit process with roles pre-defined for the team members, aligns design philosophy to brand and communicates the value generated by design to the wider team in the organisation effectively.

The study has not been able to confirm if design can lead an effective innovation process at a strategic level, but it has provided design practitioners with descriptions of the techniques that could help in strategic decision-making (Section 9.4). The techniques confirmed by the research are specific towards the role of design practitioners, the role of a leader of the design team and the development of design competencies and characteristics of the design team.

Through the three-year study I have tried to develop the theory of 'Design Driven Innovation' by Verganti (2009) and establish design as a bridge between the core business development and emerging business development and help in the formation of effective business models, while maintaining the focus on design principles, resources and competencies of the organisation. This research tries to help multinational organisations decrease the gap between emerging businesses and existing businesses through new ways of working, using design to link all innovation strategies together and build a healthy network of communication internally (Section 9.2).

The research has unearthed important discussions in relation to the role design could play in an organisation. It confirms a third dimension to design also known as the functional leadership of design. This dimension of design does not talk about design as a singular maker, problem solver or explorer but talks about design's corporate role as a powerful team with distributed functions that comprehends the vision of an alternative future by concentrating on how to operate instead of who is operating.

9.7 Contribution To Knowledge

The research contributes to knowledge in two important areas; one in the knowledge of process used for the research and also the knowledge of content that this study has developed.

Only business academics and scholars have carried out similar studies. This was the first time that research with the intention of studying business and organisational strategy was conducted from a design perspective using creative mapping techniques to better visualise the processes and provided a creative approach to a management study. There is evidence of mapping of processes by

business scholars, finance students and human resource management researchers, but none done by design. The research contributes to knowledge by mapping the innovation process followed by Philips Design at the strategic level from a design perspective.

This process provided me with the opportunity to develop a study method that integrated an iterative loop of abductive and inductive thinking approaches in an action research cycle. This innovative combination of an inductive approach inspired by business studies and an abductive approach of design study led to a cycle of robust data collection, refinement, validation and interpretation. The research used creative and designerly ways of validating and mapping intuitive thoughts and interpreting data content into knowledge worth sharing.

The contribution to knowledge in the content of the research has been made by the study confirming the conditions for design to be a leading functional discipline and confirms that design cannot be the only functional lead for a multinational organisation. The research goes about identifying the reasons why design is unable to establish itself as a leading functional discipline despite being provided with a platform like that at Philips. The research identified the difference between thinkers trying to find viable options for the future and practitioners trying to defend the core business as a major cause for the existence of a gap in the function of design in organisations. The study goes about identifying the reasons for this gap to exist specifically in design teams.

Following the literature that provides evidence of a relationship between human behaviour and organisational culture, the present study takes it one incremental step forward and establishes a conceptual correlation between different theories to understand the reasons for the gap to exist. These comparisons were between:

- Gartners Hype Cycle and 4/4-matrix to understand the relationship between individual expectation, changing time and market with respect to innovation cycles;
- Change curve and 4/4-matrix to understand individual performance, changing time and market with respect to innovation cycles; and
- Adoption curve and 4/4-matrix to understand the rate of adoption of change by the internal teams with respect to change in time and market as well as the rate of adoption of the products and services rolled out by the innovation cycles.

Another important contribution to knowledge in this research is that it takes the theory of 'Design Driven Innovation' by Verganti (2009) and identifies four gaps in its application in the strategic innovation process of multinational organisations. These identified gaps are:

- The role of interpreters in organisations: The creative interpreters, the synthesizers and the explorers.
- Balancing breakthrough ideas with other types of innovation ideas in an organisation.
- Alignment of design driven innovation with user centered innovation.
- Quantifiable value added by design through its value addition in organisations.

The research then tries to fill the gaps with additional strategies for its application in a multinational organisation like Philips. This is done through a multiple triangulation process with a third party expert and three other organisations.

The study aims to inspire design researchers to carry out further study on the topic and improve a sound knowledge and know-how for design to develop as a functional leading discipline in an organisation. The study is also aimed at

researchers in business, strategy and marketing to enable them to establish an understanding and generate theories that could link the idea of strategic design innovation process to other respective strategies in their field.

Last but not the least, I hope that this research is useful to the innovators, entrepreneurs, executives and design practitioners in organisations who hope to make full use of the values design can provide and extract all assets from it.

9.8 Reflection on the Research

Whilst the research has contributed outcomes to knowledge in the field of design leadership, the research design represents methodological and self-imposed limitations. In the following section I am going to refer to six areas that influenced my decision making during the course of the study. These six areas are;

- the design research methodology
- methodological consideration during the case study
- the involvement of Philips design during the study
- the selection and role of the other three organisations
- methodological consideration during their exploration, and
- the influence of the ethics procedure in strengthening and weakening the study.

The initial methodological problem seems to lie in the formulation of successful innovation strategies, which is not just an inductive process of deriving general conclusions from past data but is combined with an abductive process of informed design. The abductive reasoning in a few instances made intuition play an important part; hence, making validation difficult. To have a balance the study had two sets of data. Firstly, through an abductive reasoning that supported the practice of design as a function at Philips Design and added a notion of ‘what could be’ and secondly through an inductive reasoning that supported the theory of design as an

established function. The inductive approach validated the intuition generated by the abductive reasoning.

The Philips Case Study posed ontological and epistemological challenges to my research stance. The methods that were originally identified to undertake the study did not prove effective or appropriate once the case study work in Philips started. For example, on reaching Philips I realised that the culture of Philips Design and its team would not allow me to collect valid and robust data through the original proposed methods like group feedback analysis and structured interviews. Group feedback analysis did not work due to unavailability of team members, consequently leading to the use of a hybrid version of Delphi Technique. Additionally, structured interviews did not work because the participants were intimidated by direct questions or were not willing to respond due to internal political pressure, consequently forcing me to change the strategy to semi-structured interview. The need to change the plan was not because of a bad strategy but the lack of knowledge of Philips Design's internal work culture. The initial two months of internship involved reviewing the selection of research methods in the context of Philips Design, resulting in the extension of the internship by 3 months. An initial contact with Philips Design prior to commencement of the research was necessary to get a clear picture of internal culture and requirements. This initial contact in the form of interviews and observation of the team for a few days would have enhanced my efficiency and led to timely completion of the Case Study.

An important challenge posed by the Case Study was balancing the influence of Philips Design on future research design or methodological considerations. Initially, the research received criticisms from members of academia in peer reviews for using data only from Philips Design and Philips Design's influence on the decision to conduct case studies with other organisations similar to Philips. As a consequence, I had to carefully place Philips Design into the position of only acting as an advisor to the research for the remainder of the study once the initial case

study with them had been completed. Another criticism by the peer review committee at Northumbria University was made on the identity of the third party expert. The connection between the third party expert and Philips Design was seen to be too intimate and I was required to devise strategies to avoid bias and extract value without an undue influence from Philips occurring in his answers. I tried doing this by conducting semi-structured interviews that allowed me to interfere and steer the conversation in the desired direction and avoid subjective arguments in favour of Philips Design. This was very challenging although a robust data validation technique shown in sections 7.4 and 7.5 allowed me to verify the answers from multiple perspectives. On the contrary I believe that using a third party expert provided more benefit in extracting the research outcomes. As the expert was not part of Philips Design, he could then give objective opinion on the outcomes.

This study also drew upon the reflections of expert innovators and design team leaders of other selected multinational organisations. The essence of design as a potential leading functional discipline could be shown if similar in-depth case studies could have been conducted in three or more organisations. Due to the limitation of time for a PhD study, this extensive field study did not seem feasible. Hence, I decided to explore three other organisations instead of studying them in detail. Although they did not provide a detailed look into the processes of design innovation, I managed to get an overview on design and its role in these organisations. This proved to be the most efficient way of conducting the explorations and helped in the general application of the conclusions of the study.

The decision to explore three other organisations posed a challenge in terms of the selection of these organisations and later in gaining access to the innovators within them. The selection process began during the case study phase under the influence of Philips Design. The targeted organisations matched closely to Philips size, structure and culture. Nevertheless, they did not provide accurate account on

design leadership or different roles of design within their organisation, instead provides a broader perspective on Designs influence. Selection criteria were changed from being generic to ones inspired by Sineks (2010) golden circles of Why, What and How. This change helped in choosing organisations that later helped to explore different and more varied opinions on design leadership and the role of design. Additionally, the unreachable participants were accessed with the use of semi-structured interviews. I participated in industrial conferences and interviewed these speakers and collected their views on innovation and the role of design. The limitation was to use interviews as an accepted and appropriate method of collecting and studying people's recollections and reflections. Interviews limited the collection of data to a range of categorised questions, much more interesting methods could have been selected like; workshops, group discussions, debate, etc to collect more critical data.

The ethical requirements during my case study mainly related to the anonymity of participants and the commercial sensitivity of data. The research did not involve work with vulnerable people. The ethical considerations applied to my research case study in Philips Design required me to reconsider the way I communicated the collected data in the thesis. I had to collate all responses and information collected during Delphi and semi-structured interviews into an excel sheet and discard all individual transcripts of non-consenting individuals at the time of the final analysis and reporting. Due to ethical considerations, I could not provide any details of the Delphi technique proceedings in the final thesis and I had to collate all discussions into the innovation process map (Chapter 1) excel sheet format. The process of gaining the consent of individuals to publish data at the end of the analysis was complicated because most individual participants had either moved out of Philips Design and/or moved to another team following a major restructure of the company that took place after the original case study had been completed.

9.9 Further Research

The research calls for a future study that will convert the conceptual diagrammatical representations of relativity between; changing time, markets and individual expectation; changing time market and behaviour; changing time market and performance, with respect to the innovation cycles into quantifiable mathematical representations. I believe that these concepts related to the reasons for the gap between the thinkers and practitioners in the team, and that they could help to predict a pattern of change in the future innovation cycles and markets for an organisation. This could be made possible if contemporary theories of mathematical modelling (Andrews, J. G. & Mclone, R. R., 1976) are aligned with the conceptual models provided in the research. This connection between design and mathematics could emerge as a bridge of understanding for both disciplines and lead to the development of further areas of research that connect qualitative with quantitative methods.

The research identified techniques that could lead design in managing an innovation process successfully while acting as a functional leading discipline. It was not possible to validate these techniques due to the unavailability of another internship opportunity with another organisation in the given time frame for finishing the PhD. Philips Design was approached to test the techniques but due to lack of funds the dialogue could not transform into a substantial outcome. The global economic condition made organisations reluctant to engage in this type of experimental work that did not have a direct economic benefit. Thus, the testing and validation of the techniques has been stated as an opportunity for further research.

I aligned the practice of Design innovation at Philips Design with the closest published theory. This phase was the most important step to establish gaps in the information collected during the case study. This phase provided me with a great opportunity to steer my research in the area of Design Driven Innovation.

Unfortunately, further data collected in the study did not support the above-mentioned theory, as design was not seen as a driver of innovation in most of the organisations that were explored. Consequently, this made it impossible to build it into a substantial feature of the thesis. The study identifies this as an area of further research, where an alignment between Design Driven Innovation and Functional leadership of design could be established.

The study has also opened the door for further research on the use of design as a function and its far-reaching implication for idea generation, the process of innovation and other corporate functions. Due to the lack of evidence and the limited timeframe of this study, it was not possible to confirm the nature of all the techniques that would be necessary and effective to let design drive an innovation process successfully at a strategic level in a multinational organisation. Hence, there is a need to explore this field further and enrich the discussion with further data.

Further, research is required to determine the composition of a design team and its roles. My research has confirmed that the design team is multidisciplinary but there is a lack of understanding of who should be part of this team and how these individuals should be selected. A study that determines the capabilities of the individuals required in the design team would help organisations make optimal decisions in order to compose the right team for its design leadership in relation to the context of operation.

In addition to the above there should be a study focused on the competencies of a multidisciplinary design team at a strategic level. Organisations have tried to align the competencies of design teams with other corporate functions. Nevertheless, it has been impossible to determine the right competencies required by design to lead as a functional discipline at the strategic level.

This research did not get into discussion about the comparison of different functions and the way different functions work in relation to design teams. It also does not take into account the people and the skills required to do the job of a design team at a leading functional level in organisations.

SUMMARY

The chapter discusses the analysis of the research and its consequential implications in depth. It starts by describing the gap that exists between practitioners and thinkers in an organisation at a strategic level. Then it lists down the meaning, importance and usability of design as a function and as a functional leading discipline by providing the basic requirements provided by data analysis that would enable a successful implementation of design in its new role.

The discussion summarizes the findings of the research into a methodological narrative that provides rules, policies and requirements for an organisation to have a successful, smooth, sustainable innovation process not just at the strategic level but also throughout the organisation's length and breadth. The chapter concludes with research implications with promising areas for future research and the contribution of this research to knowledge.

READING LIST

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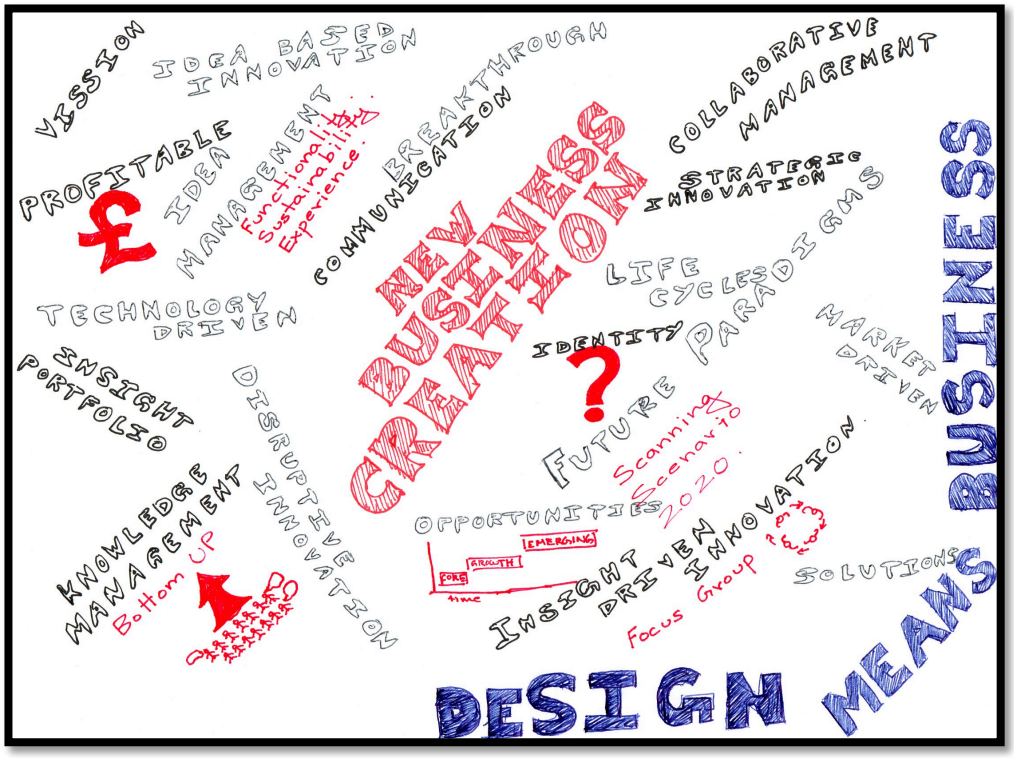
APPENDICES

APPENDICES

APPENDIX 1 – Summary of Conferences Attended During The Three Years Study



The above mapping depicts the key arguments in the conferences attended by me. The names of the conferences attended were as follows:

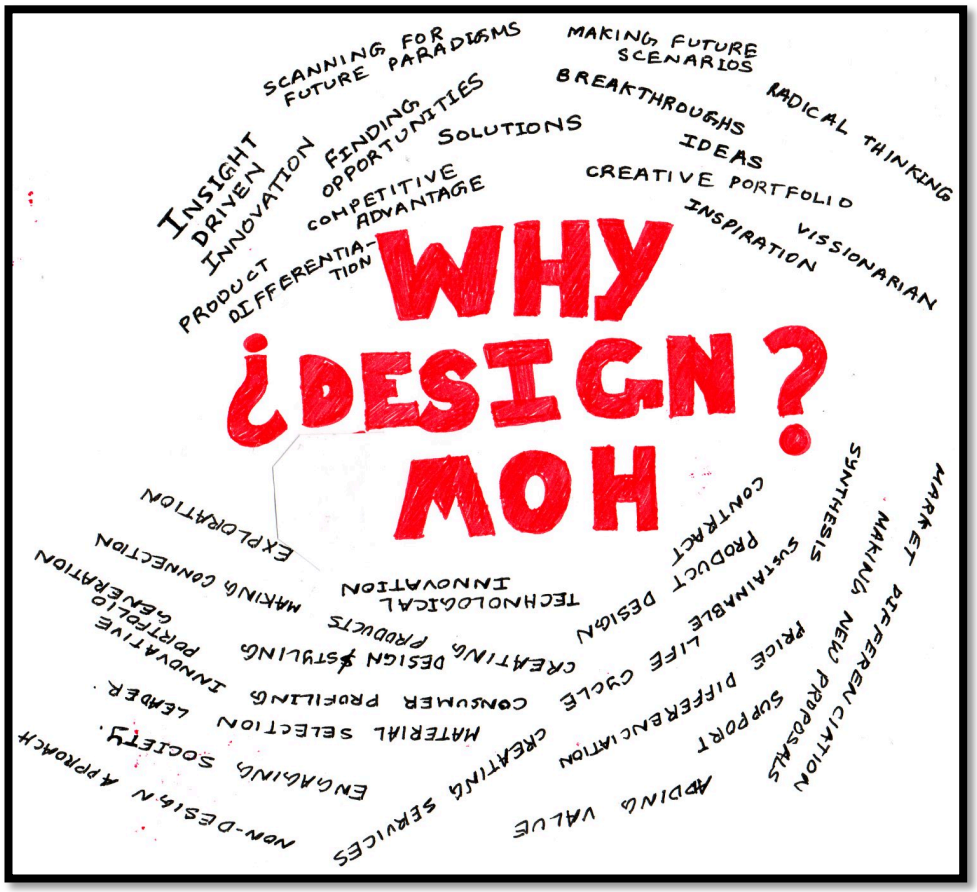
- Open Innovation and New Business Creation – Billund, Denmark
- Design Means Business – Newcastle, UK
- Continuous Innovation Network – Arhus, Denmark

Prominent keywords that join the three conferences have been penned down in the image above. The conferences highlighted the use of design and also expanded my understanding of business through its variety of presentations.

The next image summarises the ways design has been used by different organisations. The most important question that was asked by me was 'Why choose design?'. And the second most important question was 'How can design make a difference?'. The image below summarises the answers that I gathered talking to corporations and small and medium scale organisations to explore the problem area of my research.

Most corporations use design as a style differentiator and idea generator. It is in most recent years that big corporations have started to see design as a leader or a function within the organisation.

The insights gathered at these conferences helped me focusing on the issue of design being recognised not just as a function in corporations but as a leading functional discipline.


WHY
¿DESIGN?
MOH
SCANNING FOR FUTURE PARADIGMS
MAKING FUTURE SCENARIOS
RADICAL THINKING
INSIGHT DRIVEN INNOVATION
FINDING OPPORTUNITIES
SOLUTIONS
BREAKTHROUGHS
IDEAS
CREATIVE PORTFOLIO
COMPETITIVE ADVANTAGE
PRODUCT DIFFERENTIATION
INSPIRATION
VISSIONARIAN
EXPLORATION
MAKING CONNECTION
TECHNOLOGICAL INNOVATION
CONTRACT
PRODUCT DESIGN
SUSTAINABLE LIFE CYCLE
SYNTHESIS
MARKET PREFERENCIATION
MAKING NEW PROPOSALS
PRICE DIFFERENCIATION
SUPPORT
ADDING VALUE
CREATING SERVICES
MATERIAL SELECTION
CONSUMER PROFILING
CREATING DESIGN PRODUCTS
INNOVATIVE PORTFOLIO GENERATION
ENGAGING SOCIETY.
LEADER
NON-DESIGN APPROACH

APPENDIX 2 – Reflective Practice Model

1) Reflective practice model for the Case study. Provides description of my first day at Philips Design.

1. Description of the event

Phase 1: Case study
Date: 12th September 2009
Location: Philips Design, Eindhoven
Current task: Getting a grasp of reality, getting to know how the team works, who is who.
Team: team of 12 members, multi disciplinary. I have 0 knowledge of the firm and the people. Organizing meeting with big bosses. Going to coffee and lunch with others.

2. Self Awareness

I feel nervous. Don't have any clue about the project. Its my first day. First impression is the last impression.....

3. Days Evaluation

Had meeting with Steven Kyffin, Feel welcomed in the company. Know my rights, and I know I have freedom. Had a meeting with my supervisor, Reon Brand, he is supportive and he suggested me to list the names of people I would like to involve and a proposal with Case study design for next week.

4. Analysis

Meeting with Steven went well.
I have socialised with other team mates, made a few friends. Need to talk about my research with them at length.
Reon is very helpful and concern.
Meeting with Reon did not benefit in terms of the research.

5. Synthesis

Should have made a questionnaire for Steven.
Would like to go with questionnaire to Reon also as he is the key to my knowledge base.
Need to get other team members on my side.
I wish I had a plan in hand. I need to do research now and figure out my methodology.
Need an immediate meeting with my supervisors.

6. Action Plan

Read on methodology and start gathering ideas.
Set up a Skype meet with university supervisors.

2) Reflective practice model for literature and triangulation: Phase 2.

1. Description of the event

Phase 1: Preparing for triangulation
Date: 1st August 2010
Location: Northumbria University, Staff room, Newcastle Upon Tyne.
Current task: Reading as much as I can and preparing my literature.

2. Self Awareness

Its tiring and complete contrast. I am alone and no team to work with. Philips Design gave me energy to work here its difficult.

3. Days Evaluation

Reading a book on mapping of organisational strategy and process. More on a business front. Does not align with what I have done. I have 3 more books to read, Excited about the next one called 'Game changers" by the CEO of P&G.

4. Analysis

The day went well.
Raining.
It is a bit noisy in the staffroom and also lonely at the same time.
I don't like sitting here.
The book is going fine.

5. Synthesis

Will finish the book in 2 more days.
Need to make digital notes of all reading.
Download EndNote on my computer. It did not install on university computer.
Will start working in the library or home.
Staffroom is not working for me.

6. Action Plan

Make digital notes.
Install EndNote on laptop.

APPENDIX 3- Sample Of Stakeholder Interview

Questionnaire 1

Questions for stakeholder interview 1
Purpose: Linking High Design process to the RD&I process
Name: Head of high design process, Philips Design.
Date: 6/10/2009
Time: 11am – 11:20am
Duration 20 min.

Question1: What are the VP, VP1 and VP2?

Question 2: What is integrated marketing?

Question 3: Is the high design process totally integrated with the design process for integrated marketing?

Question 4: What is the time span for completion of a project under the high design process?

APPENDIX 4 – Sample Of Stakeholder Interview

Questionnaire 2.

Question for stakeholder Interview 2
Purpose: Understanding why Design process needs to be mapped and audited?
Name: Head of audit control, Philips Design.
Date: 12/11/2009
Time: 2pm – 2:30pm
Duration 30 min.

Question1: What is an audit?

Question 2: Do all processes go through it?

Question 3: Why is Design being coerced to start a mapping process?

a) As it is known design knowledge is in tacit form, what will be the implication for those kinds of knowledge processes?

Question 4: What is the time span for completion of a project under the high design process?

Question 5: What are the criteria that would have to be covered during the mapping from audit point of view?

Question 6: Do you think this will help increase of value of design in the organisation and in other stakeholders?

APPENDIX 5 – Transcript For Thinkers' Interview Questionnaire.

Name: Vice President Philips Design & Head of RD&I team
Purpose: Mapping the process from a thinker's perspective.
Date: Weekly revision in the form of Delphi structure
Time: Wednesday, p.m. – 4:30 p.m.
Duration: 30 min.

Question 1 (MA): What is the role of PIB (Philips Innovation Board) in the innovation programmeme?

Answer (PG): PIB is the Philips Innovation Board that takes care of the strategic review every year. Its participants are strategy, marketing, technology and since a few years ago design also.

Question 2 (MA): What according to you are the milestones for Philips design since the past 5 years?

Answer (PG): We are a part of the functional leadership programmeme. 10 years back we started as a contract based group in Philips. We have changed this Corporation and now it accepts design and now we influence decision making in the company.

Question 3 (MA): What is the relationship between high design process for value identification development and the core process of articulating value propositions for the market?

Answer (PG): High design process is run by the strategic marketing team. We collaborate with them at some levels in our process. Just the way design identifies value for the corporation, market does it as well. The high design process is the marketing side of value proposition into being a part of functional leadership programme. We connect with that process later in the strategic process.

Question 4 (MA): What is the role of design in multi stakeholder collaboration process?

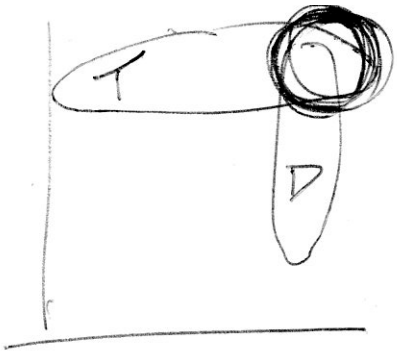
Answer (PG): Design is one of the functions at the strategic level. It leads the core process at Philips and develops value propositions for the company. We are one of the leading stakeholders in the company.

Question 5 (MA): Do you think multi stakeholder system is a problem? If yes then how do you think it can be solved? If no then what are the benefits?

Answer (PG): It is not a problem till the work gets done. It becomes a problem when the work does not move ahead. This is how we work and this is a part of our culture.

Question 6 (MA): Why is the contribution of design important in the company?

Answer (PG): At Philips Design we are aiming for design to explore and make breakthrough innovations. If you have read the book by Roberto Verganti, he proposes a breakthrough innovation by connecting disruptive technological innovation with design innovation of change in value.



At Philips Design we aim to do that for Philips by collaborating with the R&D and changing the value of the products for its customers. We build value for the company by developing right competencies to achieve breakthrough innovation in collaboration with other functions, especially R&D. We have built these competencies since the last 10 years through the innovation process you are mapping. Now we are being a part of the functional leadership programme that will require us to lead the strategic innovation process.

Question 7 (MA): What are the stumbling blocks for innovation process in Philips? Why?

Communication

Continuity

Political agenda

Answer (PG): All of the above. Philips Design would like to have the ideas debated upon within the company. Keep the debate on internally and launch products as and when the market is ready for it. Presently, we loose good ideas because we don't have a system of healthy debate and retention in the corporation. I am hoping to find a few ideas from other companies through your research. Companies like Harley Davidson, Company A have appeared to do it well. But I do not understand how they manage.

Question 8 (MA): Looking at the Philips culture, what do you think is the best practice for Philips design?

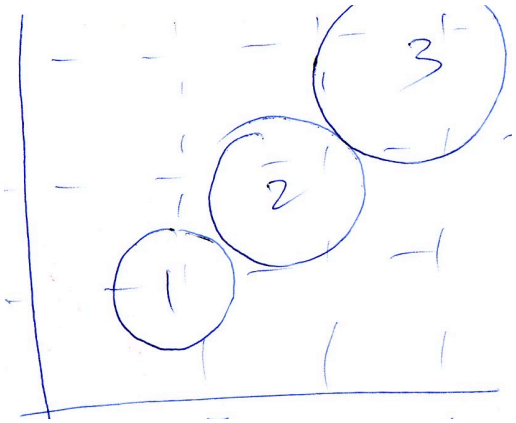
Answer (PG): To be a part of the functional leadership programme and deliver to create creative portfolio for the corporation. Though we need to do a lot more to retain the ideas and increase focus, align all steps.

Question 9 (MA): According to my study, the business picks up not many projects or themes etc. Why?

Answer (PG): Same reason as I told you before. Most are lost. And others don't have the right competencies and market to be rolled out.

Question 10 (MA): What are the key things that RD&I align with the business calendar?

Answer (PG): The whole RD&I process has to be aligned as we work with the strategic process that happens every three years. So the cycle has to be completed within that period of time with proposals. As a part of the core process the RD&I team delivers in each of the three innovation types. We have tried to achieve this by putting people with each developed competencies in all of these circles of innovation in the 4/4 matrix.



We at Philips Design follow the process in two important stages; first is future perspective with probes and future scoping working hand in hand to generate hypothesis for experimenting and developing insights by talking about the probes to the people; and second is theme research where we experiment with each hypothesis through personas, prototyping, while doing that we develop competencies, news ways of working, scope future scenarios, find new weak signals to transfer to probes for their cycle to run etc….and in the end come up with working models and creative innovation portfolio for Philips. One of the success stories are the theme we are working with called sleep.

Question 11 (MA): In 3 years from now what does design want to provide in business? What are the major challenges you can foresee?

Answer (PG): Keep developing value for the business. Proposing new ideas, breakthrough propositions, enable a positive debate about the hypothesis we generate. External conditions, budget etc could be named a few.

Question 12 (MA): In the Core processes, I see time as a major role player. Should fixed time for each step including Probes be stuck to? If not then how can the processes be realized overall?

Answer (PG): yes. But probes works like an insight generator based on the weak signals they find. If we have a platform for healthy debate probes insights and ideas could be put to healthy use and generate some more value.

Question 13 (MA): Are there any other benchmark design companies that you can name? And why?

Answer (PG): Harley Davidson, Company A, P&G, Apple.

APPENDIX 6 – Sample For Practitioners' Interview Questionnaire.

Question for practitioners
Purpose: Mapping how the process is carried out
Date: weekly revision in the form of Delphi structure
Time: Tuesday & Thursday, 3pm – 4pm
Duration 60 min.

Question1: Which process do you head?

Question 2: Could you name the most prominent activities being carried out in the process?

Question 3: Could you name the inputs required for each of these activities?

Question 4: Do you have any other stakeholder input at any of the stage during your process?

Does the communication happen in a formal manner?

If no to the above question, how do you record the communication, transaction?

If yes to question a) in what mode the communication happens?

Question 5: What are the outputs for your process?

Do these transfer as inputs to other steps?

What is the mode of the communication?

Do you have to collaborate with any other practitioner in their RD&I team?

Is there any difficulty in collaboration?

Question 6: Could you list down the limitations of your process?

Question 7: Could you describe the challenges you face while carrying out your process?

Question 8: Kindly read the map and comment on the sub processes and its structure.

Question 9: If you don't agree with any of the variables could you let me know why?

Question 10: Could we go through your process description one more time and highlight problems, issues and things that you can confirm?

APPENDIX 7 – Third Party Triangulation 1 Questionnaire.

Questions for the first third party triangulation.
DATE – 10th June

Questions on process mapping:

1. Being aware of the innovation process in Philips design I would like you to critically analyse the process designed during the case study (Improvement suggestion).
2. Do you find this map effective in the Philips scenario and not posing a problem to the creativity of the practitioners, owing to the fact that process, deadlines, rules, paperwork affect creativity in a negative way?
3. Looking at the Philips culture, what do you think is the best practice for Philips design?
4. During the research it was found out that the practitioners did not recognize the innovation system. Why did this gap exist?
5. How do you think this map can be best implemented in the system?

Question on the innovation approach in Philips:

1. Philips is one of the few companies with design at the core of its innovation process; do you see academics, practitioners, and innovators acknowledging the fact that design has a functional leadership in the company?
2. Do you think multi stakeholder system is a problem? If yes then how do you think it can be solved? If no then what are the benefits?
3. What is the importance of design in multi stakeholder collaboration process?
4. What are the stumbling blocks for innovation process in Philips? Why?
    a. Communication
    b. Continuity
    c. Political agenda
5. Through the research I found out that Philips design had a sound innovation decision-making, but lacked in innovation process deployment and metrics to measure innovation? How do you think this problem can be handled?
6. How sustainable has been the innovation system of Philips in the past 10 years?

Questions focusing on literature review:

1. In literature it is a team effort to perform strategy on the contrary in Phillips most processes and steps are single man's idea. How do you think this can be improved? Do you see that as a problem?
2. Booz Allen Hamilton's 2007 annual study of the world's largest corporate R&D spenders revealed that there are 3 types of innovation strategy in companies; Need Seekers, Market Readers, Technology Drivers. Where do you see Philips in among the three?
3. Making strategic maps is not new to companies. Being in Philips did you come across any other version of the map of the strategic process?
4. In the literature strategic maps are work of the business management where design plays no role at all. How do you justify it?
5. There are software's to help companies realize their strategic maps. But the software's are mostly financial and business focused. Do you see software's being developed with design perspective for mapping purposes?
6. Current literature speaks of innovation strategy based on need, market & Technology. Design has still not been given the importance of being an innovation driver. Do you think its true?(Jaruzelski and Dehoff, 2007)
7. As the management puts a lot of importance in division of strategic map into 5 major zones called financial perspective, customer perspective, internal perspective and learning and growth perspective. Could you name important perspective from a design point of view?
    a. Do you see the better communication channels ones the domain system is installed at the corporate level?
    b. Why is the contribution of design important in the company?
    c. In 3 years from now what does design want to provide in business? What are the major challenges you can foresee?

APPENDIX 8 – Transcripts For Third Party Triangulation 1.

Transcript of the 1st third party interview
Interviewer name: Professor Steven Kyffin
Venue: School of Design, Northumbria University
Duration: 2.5 hours
Purpose: The interview with a third party was done for data triangulation between the conclusion of the case study, the literature and the third party expert.

Explanation: Here is the paper of my presentation. I will show you what I have done and how I did it. Highlighting the literature and how it contrasts with the Philips internship.

I will start with insights from literature. The most astonishing thing is that everybody is talking about design driven innovation but there is no literature about it. There are no papers that say that how can design lead a role of functional leadership and drive innovation. The perceptions and theories attached with the philosophy.
Answer: Apart from the one Paul Gardien got called new design, in design, which is an international design journal, Verganti. But basically there is very little information.

Question 1: It in the head of the people. They are thinking about it also practicing it but there are no texts that can be cited. Secondly, every company maps innovation process but mostly its from the business side, management side, economics and finance, marketing and consumer perspective etc. So what I am implying is that there are different perceptions of mapping innovation but design is nowhere to be seen.

Answer: So you are saying that the world is very aware of the business innovation, logistics innovation, financial development innovation, the consequences of new products and systems on the financial success of the company. No ones really mapping the content being innovated, or the changing world to which the new content and ideas are being brought. And how that is being innovating both ways the company operates and the services that it offers or the world that it touches that is not being mapped. In order to proof the values that is being offered and the values to which they are responding.

Question 2: So how do you map that is the bigger question that is a part of my PhD.

Answer: We tried it in innovation architecture didn't we? That's what it is a map of, a structured drawing to show emerging world views, company marketing platforms, values and experience spaces within that which will guide the innovation process within that with the people.

But that's not written down either anywhere. Apart from the part that you have done. It was written down in Philips but not anywhere outside.

There are no true axioms on process, which can be followed. What we are trying to do in the desk form process is to try to get the people together who are working on new methods or new ways of working that could be seen as scientific principles that would always guarantee results. It's just possible that it doesn't seem to exist in design led innovation. So much in dependent on energy, commitment, passion.

Question 3: What about Logistics? The practical issues?

Answer: Well, that's the issues, that are the logistics and practical issues capable of being defined exactly like the principles of accounting or principles of product development or factory management. Making new thing happen in a new way to a new world, which is our innovation, may not be capable, or worthy of being possible to deconstruct it.

Explanation: As we move forward. This slide designs the positioning of my project, which was one of the core processes. And I was in the team, which defined new value propositions and value contributions. Also I had to show how this level of strategy connected with the business and other parts of the sectors.

Comment: Very Good.

Explanation (MA): Now I will talk about the methodologies.

Comment (SK): These are the methodologies you actually used?

Explanation (MA): yes…and I started with the literature review as to what are the kinds of innovation processes in the world, and in different companies that I could get my hands on online.

Followed by literature review of innovation standards being followed within the company. That was done by literature gathered from company intranet, the presentations provided to me, the meetings that I attended etc.

All the information was then mapped according to an evolutionary time scale to make sense of the direction the company was going into as well as to demarcate the common themes and the uncommon themes in the process development since the last 10 years.

The next methodological step was the most interesting one as it mapped the real tie innovation process. Two approaches were taken for the mapping. One was top down approach and 2nd was bottoms up approach. Top down approach mapped the process from the strategists' point of view. Which allowed me to get a view of the process that is being aimed at. The bottoms up perspective helped me understand the process from the practitioner's point of view as to how was the process actually being followed. This was done to find out the gaps and the similarities.

Answer: My insights already just thinking about it from back of my mind is that the top down perspective was to lead the way to 5 years out and the bottoms up perspective was to lead it up to 2 and a half years. And then there would have been a gap. The gap is between a pull from 5-10 years in front dragging people towards them and a need of a designer and a product developmental cycle in the trying to get out the new MP3 players.

So actually the way you have drawn their, there is a bottoms up perspective that that goes from 0 to 2and a half or 3 years and the top down approach ranges between 5-10 years and then there is a white space in the middle representing nothing or disconnect. So actually it did not overlap. So top down perspective is horizon 1 ranging from 5-10 years and bottoms up perspective is horizon 3 ranging from 0-2.5 years and this thing in the middle is a big gap.

Question 4 (MA): And this is what they are struggling now as well. They know where they are, they know where they want to be, but they don't have a path to get there.

Answer (SK): We tried to define it with the contract research but no one knows who was the owner of that programme. Did Gavin own the contract research programme or did we earn it.

Explanation (MA): And they are still struggling with it.

Comment (SK): Is it?

Explanation (MA): I have seen the worst of Philips design. The anger, ego wars etc. And the problems.

Comment (SK): Good for you.

Comment (SK): The methodologies are very intriguing. Could you go back? Have you covered all of it?

Explanation (MA): No I am in the 8th step where I have to triangulate the findings that I got with Philips with you. And once I have some conclusion I go to Philips again and to other 3 companies.

Explanation (MA): The next slide is the time line that I made from the internal literature review. But I didn't get anything out of it. Because there were a lot of overlaps happening, there were a lot of things on paper but in practice they were missing.

Comment (SK): So these lines or texts do they represent new methods or examples, new things discovered or propositions? What do they represent?

Explanation (MA): Well they represent processes, programme and examples related to them.

Comment (SK): So we did a lot didn't we, even if it was a chaotic approach we managed to do a lot?

Explanation (MA): Yeah, the information ad work done was massive. Only if there were a system to capture it or make it consistent it would have been marvellous.

Answer (SK): Paul and I were committed with the drawing of the top down push and bottom up pull to try to get an innovation process but many people were not committed to that. What they were committed to was an analysis speculation because they never got anybody to admit it to themselves or to me. So, the speculation is a projection of me onto them. So that's like " I want to do it this way coz I find it interesting and I want you to fund it." And " I am a designer and I don't know how I should articulate so that it's valuable to you or to the but I know its right, there fore keep funding me."

Question 5 (MA): So its all about the money and budget, money?
Answer (SK): But money for what though? Money for me to be me. Funding for me to be me.

Question 6 (MA): So in Philips design is it the RD&I team propagating that they are thinking about the future, or do others recognize their incentive as well?

Comment (SK): What is your conclusion to it?

Explanation (MA): Well people within Philips design didn't know what we were doing as a team. So I guess there is a problem of communication deployment within the bigger team of designers.

Comment (SK): But we talked about everything, colloquiums, presentations etc. But then it seems the communication wasn't happening. So it was being broadcast but it wasn't being received.
I also feel that people were only receiving with either what aligned or conflicted with what they were doing. So people were receiving everything within there own context. So, if we helped them do what they want, which

we should have been, then they agreed with but if conflicted with what they wanted to do or it was neutral it was ignored and therefore received as non communicated.

Explanation (MA): The next methodological step was to define the key criterions of defining the communication process. Like the inputs for each process, deliverables, key activities, process name, focus, when, how etc. It also specified how it connects to the business and other sectors.

Comment (SK): I know the answers to all these questions. But whether it was not happening was because the people were week, they were ignorant of it or they deliberately sabotaged it. Week as in it was difficult, they could not handle it or whether it was sabotaged, or just ignored.

Explanation (MA): I think they were insecure.

Comment (SK): But what does insecurity cause? It brings about weakness. They weren't just about to overcome the difficulties.

Question 7 (MA): They wanted ownership. They wanted importance because one of the downfalls of multi-stakeholder programme is that everybody is correct, so how do you put yourself forward?

Answer (SK): If they are the followers of the worldview where the self, the ego is the only security you have, the self is the only reference point and multi stakeholder point of view as the only external reference point, then it doesn't work. Because you are your reference point. And everyone else is their own reference points so common goal has no generosity or you don't have a generosity towards common goal. Maybe in the secular worldview or postmodern worldview cooperation is not possible. Because in this view the self is so important that everybody has to cooperate in your own self.

Another worldview is that could you work as a cooperative or collection of singularities trying to find out the way to meet their own objectives.

Northern Europe as a culture developed the cooperative. Like farmers cooperatives, the whole Dutch system is where mediating through each other does work,

So there is some sense in human beings in here that they want to do that but somehow our nature stops it. We have to overcome that nature in order to achieve what we know is right.

Explanation (MA): And that's where I think people with decision-making power come into picture that can put things in line.

I would now like to show you the sheet, which we defined. This defines the detailed version of the innovation process. This was a tedious process with a lot of interviews and information. While doing this I found out that most innovation steps and process are coming out of the brains of the people and is not actually a team effort. So if one particular person quits what happens to the process? Moreover most people were very careful while giving me the information because they did not want the audit team to question them later.

Comment (SK): The question is does anyone value the assessment of the auditors. Or whether it's a necessary evil that they have to go through in order to get a certificate or it has no bearing on the actual reality.

That is what amazes me about people in general that is; that they jump through all these loops in a particular way, and you know you are never going to do it. You can either fight your way or say no I will never do it. And if the decision you take is that you are never going to jump within the loops anyway then why not construct a complete false environment and then not comply with it later.

Question 8 (MA): I have another question for you. The practitioners say that they cannot follow the process because it is time consuming. For them creativity doesn't know any process. So is there any design innovation process?

Answer (SK): No, there are many. And everybody follows a slightly different one. Because as you are saying the triggers that gives you ideas are according to you and your mood, the problem, the people you are with, the time. So therefore there is no axiomatic truth as to have a new idea and no there is not an A DESIGN PROCESS there are many.

When you set a brief a question in a verbal language to answer it assumes that there is an answer and it assumes that there is an answer that represents the answer in the structure of the question. What designers and crazy people do, is they start there and they suddenly find out that the real question that they should have asked is only known when the answer has been found. What the brief does is trigger the question but does not specify the solution in another language. So the answer that you discover, or the portfolio of answer or the nature of the solution that you find is triggered by the research question and is not comply with the research question completely. So there is no predictable path from question to answer. The research questions are open and you might discover many things to tell you that that research question was not the right one. So the only way you prove that the answer that you now have answers the question by reframing the question after you have got the answer. And that's called post rationalization.

Comment (MA): Yes and that what happens in PhD as well.

Explanation (SK): That is what happens in northern Anglo tectonic thinking. And suddenly they say you are cheating. Because you are redefining the start after you got to the end. If you know the exact question then it means you now the end. Because you know exactly what you are trying to find out and you know that it's always changing. What you can do is have the research questions, own the territory, allow the conversation to happen, allow spaces where you can find the thought that redefine the starting point and take you to the next level.

I think it's perfectly reasonable to redefine the question after you have found the answer.

So the answer to the question that you asked is that no there is no way but there are many ways.

Question 9 (MA): Then why do we have these processes?

Answer (SK): We have these processes so that when it all gets flimsy and you loose energy and you start to panic and you wonder whether you are wasting money and you know whether you are getting no where and you loose confidence in hat you are ding you have a structure that says, no its ok. I have found this, I have got that, and I do know this. SO it's a way of enabling you to stop and in what you are doing and find a value in it. So its like a structure or a scaffolding that helps you monitor and value what you have actually got in relation to the starting point and how it has changed.

Its not a mathematical formula to achieve the given result that you predicted from the beginning.

The observation that we had with McKinsey around the theme research and probe research. Yes I am probing but I am not probing around for nothing. I am probing around for all sorts of things and many of the things that we haven't even thought of that will discover. And I have a way of making sense of them to know whether they matter or not.

Question 10 (MA): An i presumes that was the idea about probes. So that the debate continues?

Answer (SK): There were signals things happening, which they could discern as entities of happenings, which were causing social change, or social behavior change or peoples values were changing or consciousness was changing. In order to amplify those signals and get inside and have a debate the probe team made installations, triggers, probes to go into that weak signal and blow it up a bit, to see what was there. Not in order to find business, if one came out good if it didn't that's al right. At least they new that it was a signal that was a sign of not anything that was actually going to be of value to them right now but might be a value in future. But it is a signal, a sign of something that represent value or meaning of something,

somewhere. So, is that meaning that we can bring more to life, is that sign that we could exploit, respond to, contribute to.

Again I would repeat there is not one process, there are many scaffoldings that different groups of people should use, to reflect on the amount of investment, time, the amount of people, which there shareholders aren't confident in which you are investing for the benefit of the society and the benefit of the company.

These structures are not control structures. And its true that designers feel threatened by the control systems. I don't regard them as control systems I regard them as support systems so that when life gets difficult, confused and difficult and I cant think fast enough I have something to reflect upon and say do I keep going or do I stop, do I panic, how do I calm down? So nowhere I see it as a control structure.

Explanation (MA): Al right. So ones the detailed process was defined. It was visually simplified for the team and other people who did not need to know these details. And this is what we came to.

Comment (SK): I don't see massively shifted here.

Explanation (MA): And ones the graphical view was made it triggered a discussion and lead to changes again in the name and number of sub processes.

Comment (SK): So if these processes are happening simultaneously in the minds of a person it can be restructured and deconstructed for the review of the auditors. Because when you are in a multi-stakeholder community people have to account for the investment the other people have invested in you. Why their trust is well founded because we are not a one-man autocracy.

Question 11 (MA): So you do recognize the process and it fits the vision of Philips Design that you have?

Answer (SK): Yes this is exactly how we had it.

Question 12 (MA): Is there any abnormalities or suggestions you would like to give?

Answer (SK): The only thing I noticed is that this is the Philips design part of it. I don't see the part where it connects to the marketing, strategy, technology part and the sector bit of it. My vision was to keep the stakeholders connected together at this level. So that the feedback and communication is free flowing.

Explanation (MA): I was getting into it but Reon stopped me because it would have lead to a lot of debate and the process would have got stuck in the middle of the war. Why do you think practitioners would not accept this process and laugh it off?
Answer: I don't know why wouldn't they accept it from there heart but one of the reasons could be that it wasn't a reality for them. They didn't realize that what this was trying to do was to provide them a scaffolding to take the company from 2002 to 2022 in a wise and well-founded way. In response to the potential needs of the society in 2022. They didn't know that was the purpose.

Question (SK): And why wouldn't they know that was a purpose?

Explanation (MA): Well, is because they didn't share their problem? Because their daily problem, their personal self centred problem that they were employed to solve. So this process was seen as a process in context to the world they are living in. So that could be one reason for them to reject it because the process does not indicate the reality for them. This is what I can see as a reason to reject the process as a process.

Question 13 (MA): How do you think we can implement it and make them own the process?

Answer (SK): By getting them to realize or make them see them selves in a bigger team that will take the company from today to the next 20 years like

2020 or 2030. There are few people plotting the world for 2030, some for 2020, some for 2010 while all will be a part of one community. They might be designing a teacup for March will be in the market for the next quarter next year but it will still be a part of the story. Moreover, they don't need to accept the process they need to recognize it.

Most people are doing it in their own lives. Most of them are trying to get to tomorrow.

Question 14 (MA): What do you think is the problem for Philips design where innovation is concerned? Is it political agenda, ego, continuity of a process?

Answer (SK): It is a paradox. A scandal. We are so desperate to hold on to today of what we know because that's our certainty that we find it very difficult to think about long-term future. And the timing of getting through today and tomorrow is at loggerheads to each other. Another stumbling block is I trying to handle my family, my food and my money and the other is the group, the company, the companion, the people I move with moving. I don't think it's a Philips design problem.

You can innovate 10 levels simultaneously and you can innovate three horizons simultaneously. So certainly you have got a Cartesian level of matrix of 30 different options to manage simultaneously over in their case for 10,000 people.

Remember we are in the machine world of modernism where everybody is one bit of the machine. No one is concerned of the direction there duty is to keep their part of the engine to keep running.

Question 15 (MA): The next question for you is that in Philips every process and sub process was a single man's idea. How do you justify it?

Answer (SK): Well I think it is inevitable. If you take the worldview that everybody is in the centre of his or her universe it is inevitable that this would happen. If that is human nature. Self-preservation then in an instinct

it is not helping the group. It has to be amplified to such a way that the ambitions of the community are kept in a check. So companies use the people in Paul's position so try to keep the people together and focused on the community development rather than them having their personal ego's to dominate. There is nothing wrong to have an egoistic approach. But the real struggle is to make the self-part contribute to the growth of the group performance.

Question 16 (MA): Through the literature review it was found out that there are three types of innovation approaches from company's i.e. Need seekers, market readers and technology drivers. What would you consider Philips to be?

Answer (SK): Philips admitted that it was technology driven for many years. Stefano became one of the people in Philips who tried to see the need of the people first rather than the want. So that we would answer to actual needs rather than self-destructive needs. So that we would understand the core values rather than the values driven by seduction. I think Philips ambitions are to be responsive to need. Philips also comes up with new technology by chance and discovers the new ways of doing things, because they have to find the ways to extract the values out of the market to pay for the things they are using. So while we are changing from one world to another there is bound to be a residue of the push of technology as well.

We always stumble at new ways of doing things and provide new technologies to work with.

Question 17 (MA): Did you see any other kind of mapping while being at Philips?

Answer (SK): The one mapping that I came across was that there are the needs of the world. You can't cater to all of them so you have to select a few to respond to, and be confident about that they were good enough, and make sound choices. So the portfolio selected was a kind of mapping. That is how do you decide on behalf of your shareholders, staff, investors, clients,

to cater to the health and well being issue and not entertainment or not doing hospital or home or decision not to do anything with the life on a move.

We mapped it according to the need of the company to make a selective portfolio.

Question 18 (MA): there are a lot of software's that help in making an innovation process. Do you see software from a design perspective being made to make an innovation map?

Answer (SK): Yes of course. Because I defined the one that you have hear. But I see it as scaffolding, to be used by people to explore, find their creativity, bring together different stakeholders, without panicking if it delivers more or less than they expected.

Question 19 (MA): Whereas the management puts a lot of importance in division of strategic map into 5 major zones called financial perspective, customer perspective, internal perspective and learning and growth perspective. Could you name important perspective from a design point of view?

Answer (SK): Well in design the ideas to bring about 5 things come together. We showed that in a triangle form in Philips. We had a pyramid we had the values spaces of the world, Brand position, experience context, value spaces, solutions and value spaces developed.

Explanation (MA): This has brought us to the end of the talk. Thanks a lot for your time. Before I end it I need to take your permission to take your name in my thesis.

Comment (SK): Yes indeed!

APPENDIX 9 – Interview With Company A.

Exploring other companies
Venue: Design means business, The Sage, Gateshead, Newcastle Upon Tyne & European Open Innovation conference, Denmark
Interviewee: Former Design Lead at Company A Design Research.

Question 1 (MA): Do you foresee design at the core of its innovation process?

Answer (Company A): Yes. Design plays a role of an inspiration to the Company. Inspiring them about future prospects. Like we proposed that Company A could become a bank for the people. The fact that made us come to the conclusion was value mapping of Company A in the lives of the people around the world, the way they were growing, and scenario creation, loyalty of the people involved with products of Company A at that time. It is a team that integrates the corporate function and the CTO office working very closely with Company A research centers.

Question 2 (MA): Do you see academics, practitioners, and innovators acknowledging the fact that design has a functional leadership in the Company?

Answer (Company A): There is nothing like leadership role. We take the journey together. And the journey is about people, emotion and excellence. If you have a clear defined goal then your journey will be smooth.

Question 3 (MA): Are you implying that Company A has a predefined and an explicit process existing?

Answer (Company A): (laughs) No. Company A has the right people who are focused on understanding people, and they trust their instincts. I meant

the mission and vision of the Company is well defined and everybody knows their roles and acts with responsibility.

Question 4 (MA): Will you categories important factors/perspectives that should be taken in management put a lot of importance in division of strategic map into 5 major zones called financial perspective, customer perspective, internal perspective and learning and growth perspective. Could you name important perspective from a design point of view?

Answer (Company A): Perspectives of Design? More than perspective Design needs ingredients to be successful. The ingredients would be explorative development, exploitation of ingredients, culture, allowed to play with the assets of the Company. Its like making chocolate chip cookies. With every ingredient the taste changes. The measurement of the ingredients also has effect on the taste. And as a Design head in the Company its my duty to see that all ingredients that I have are put in the right concentration to make a perfect chocolate chip cookie. Also we believe that Trust gives freedom, freedom brings creativity and creativity brings Innovation. Company A Research center has 4 broad themes, our role is to look beyond the boundaries of these themes and come out with value additions to the creative portfolio.

Company A's design ethos lies far deeper than aesthetics and practicality. Fashion, religion and even weblogs are providing the human inspiration behind its mobile phones.

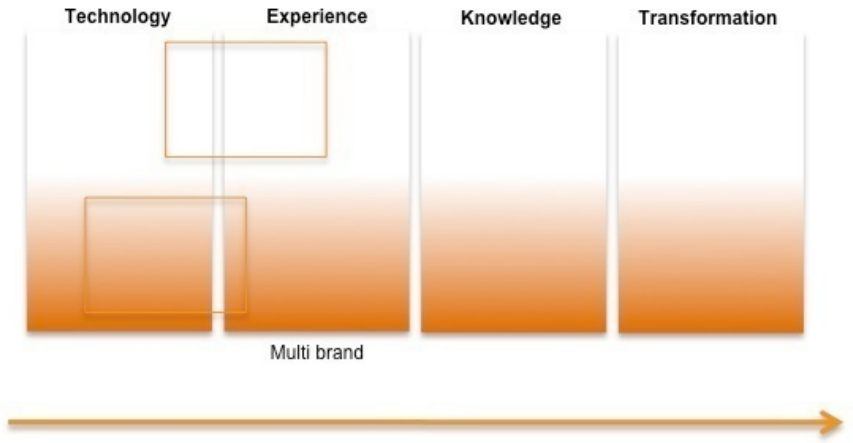
Question 5 (MA): In the literature strategic maps are work of the business management where design plays no role at all. How do you justify it?

Answer (Company A): I am not an academic. And I don't think a map could define the strategy of the Company. Company A is a multidisciplinary Company and every discipline has its own strategy. It's all about facilitating the right kind of ingredients around rather than defining their own area of concern.

Question 6 (MA): In literature it is a team effort to perform strategy on the contrary in practice most processes and steps are a single man's idea. How do you think this can be improved? Do you see that as a problem?

Answer (Company A): Its not a single mans idea. It is always a team effort. But the role of the leader is very important. As I explained before he is the facilitator of ingredients in the team. Like a coach in a soccer team. His responsibility is to exploit the resources he has. His resources are his team and he should have the eye to see who is good at what and place them at the right spot. If he is unable to do that then he is not a good leader.

Question 7 (MA): Are you aware of the innovation paradigm theory?



Answer (Company A): What are these? Like the market type? Yes. Every Company starts as a technology oriented Company but wants to grow towards transformation economy where you see these days the concept of social innovation etc. And experience and knowledge are the platforms that they have to pass to reach the transformation phase. Yeah, sure. I would say right now Company A is in the middle of experience and technology. Its a mobile Company where the platform has to be technology, we can never get

detached to that but yeah a nice blend of the rest platforms as you call it would be a great idea. Specially if its at different platforms and sectors.

Question 8 (MA): There is a visible gap that exists between the thinkers and the practitioners of innovation. Are you aware of that?

Answer (Company A): The gap exists due to lack of trust. And the leaders role is very important here to close the gap.

APPENDIX 10 – Interview With Company B.

Transcript of the Interview
Venue: Open innovation and new business Innovation conference, Hotel Lego Land, Billund.
Designation: Vice President, Cabin Innovation & design; CEO Fuselage & Cabin.

Question 1(MA): Do you foresee design at the core of its innovation process?

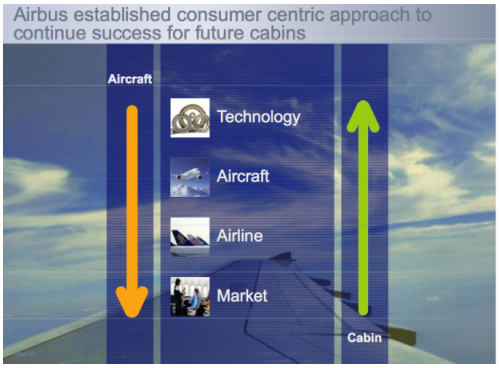
Answer (Company B): No. It's difficult. Company B is not a consumer good Company. Its does use customer insights to translate into good design and valuable options for its target customers. But it's difficult for a heavy industrial good Company to depend only on designers.

Question 2 (MA): Do you have a design studio in Company B cabin design?

Answer (Company B): Yes we have a cabin design and simulation studio. And it has a team of designers. But the design studio is headed by engineers (laughs).

Question 3 (MA): In your presentation you defined the idea generation process very effectively. Would you say the process is well communicated within the designers who work at the bottom level?

Answer (Company B): It's a complicated Company with a lot of stakeholders and one mistake can cost us massive amount of losses. So yeah one of the necessities is to make sure everyone in the team is on the same page and the way of working has been in the induction process of new comers. Its a Company policy to introduce them to the systems and protocols. Also I must include that we at Company B have two parallel innovation process running catering to two platforms; namely aircraft and cabin design. Both these processes start at a different level.

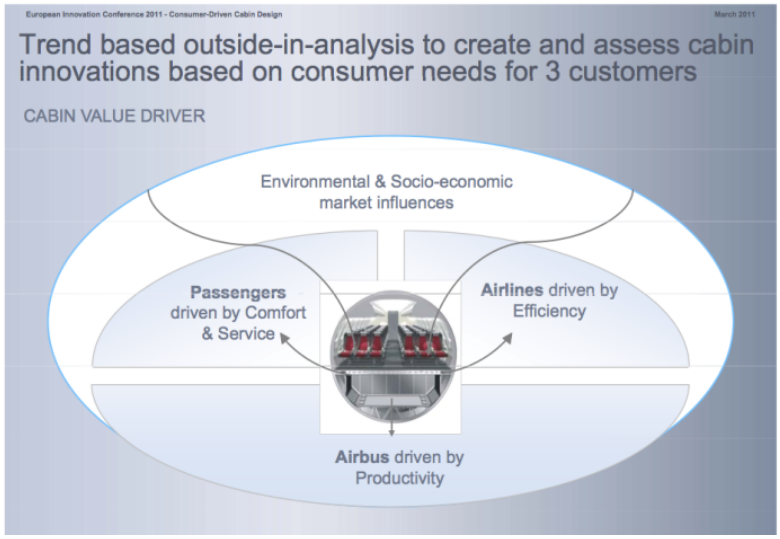


Question 4 (MA): Do you see academics, practitioners, and innovators acknowledging the fact that design have a functional leadership in the Company?

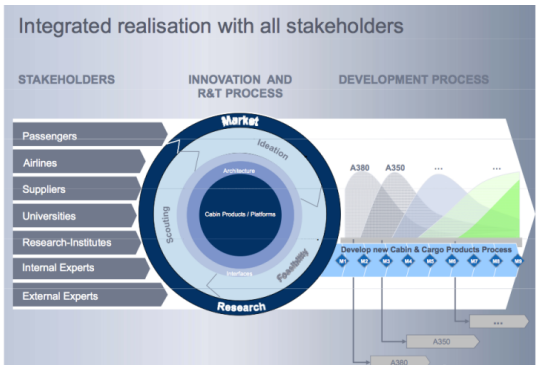
Answer (Company B): I have no idea about that. But Design is important support system in the Company.

Question 5 (MA): Will you categories important factors/perspectives that should be taken in management put a lot of importance in division of strategic map into 5 major zones called financial perspective, customer perspective, internal perspective and learning and growth perspective. Could you name important perspective from a design/new idea generation point of view?

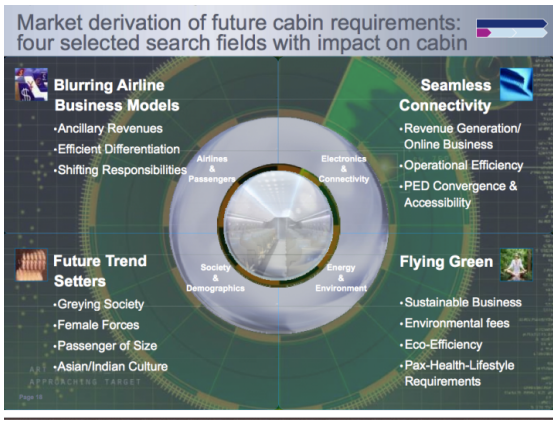
Answer (Company B): We have 3 main customers/stakeholders, Passengers: driven by comfort, airlines driven by efficiency and Company B internal stakeholders driven by productivity.



So for us the important perspective as a Company is customer centred design approach and an open innovation model in the design and innovation process. We have a process, which realizes a product with full-integrated stakeholder approach.



Once we are in the process we have a 360 degree monitoring of future needs with aviation and cross-organisation-radar. This system helps in anticipation of future needs. We have 4 major future scenarios that we are focusing on for 2050.



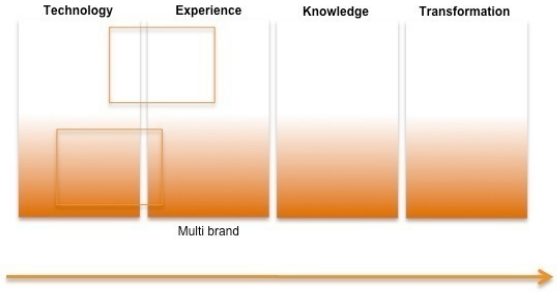
Question 6 (MA): In the literature strategic maps are work of the business management where design plays no role at all. How do you justify it?

Answer (Company B): Mapping is important and should be included in the Company training policy. Company B has its induction programme where this is taken care of. The Company culture also helps in enhancing the knowledge of the people in the team. Its not one department who has the job of mapping, but its a team effort. Even without a proper explicit map a process with trained professionals work in a good way.

Question 7 (MA): In literature it is a team effort to perform strategy on the contrary in practice most processes and steps are a single man's idea. How do you think this can be improved? Do you see that as a problem?

Answer (Company B): It is a problem there is a divide, but its not a single mans idea. Though authority is very important. Structure is very important. It comes from the culture. We are a German Company and our way f working proclaims structure and efficiency.

Question 8 (MA): Are you aware of the innovation paradigm theory?



Answer (Company B): mm…Yeah, we are still in technology and for us to move forward can be a tough choice. We cannot remove technology from our roots!

Question 9 (MA): There is a visible gap that exists between the thinkers and the practitioners of innovation. Are you aware of that?

Answer (Company B): Yes it is a problem. And we have engagement and new ways of interaction to solve those problems but I agree it exists. A strong leadership and a good mechanism of involving people could help. Also a method to engage employees internally, good teamwork and good incentive by the Company for new ideas could lead to a bridge.

Question 10 (MA): Do you think design could help in bridging the gap?

Answer (Company B): hahaha…yeah why not. Any department who can bring people together. Specially designers like yourself who are good storytellers can engage people internally and make them see the wider truth. Open their mind towards future and better thinking. Also develop tools that would help them be efficient in thinking out of the box.

Question 11 (MA): Have you never had a design head in your Company?

Answer (Company B): We had one but it did not work out. The person could not lead the team.

Question 12 (MA): Whom do you blame for that?

Answer (Company B): The universities for not teaching desired skills to the designer.

Question 13 (MA): Would you mind if I quote you in my thesis?

Answer (Company B): No, No problem at all!

APPENDIX 11 – Interview With Company C.

Exploring other companies
Venue: European Open Innovation conference, Denmark and Open innovation and new business Innovation conference, Hotel LegoLand, Billund.
Designation: Head of Customer Research Center.

Question 1 (MA): Do you foresee design at the core of its innovation process?

Answer (Company C): Yes. Design makes our corporate identity. Design helps in keeping the identity of our products stick to the gene pool of Company C. Helps in communicating the image of the brand strongly to the customer.

Question 2 (MA): Do you have a design studio in Company B cabin design?

Answer (Company C): Yes we have several design studios. Mostly Designers are part of the strategic multidisciplinary team involved in consumer research in Germany that leads to all our innovations.

Question 3 (MA): In your presentation you defined the idea generation process every effectively. Would you say the process is well communicated within the designers who work at the bottom level?

Answer (Company C): We call it the wild side of Mercedes-Benz development. Where we indulge in creativity. We have made the environment that could enable creativity by provoked coincidence. We also encourage natural coincidence.

Question 4 (MA): Do you see academics, practitioners, and innovators acknowledging the fact that design has a functional leadership in the Company?

Answer (Company C): Design has an important role in the decision making process and is the part of the cooperation and is recognized. But I

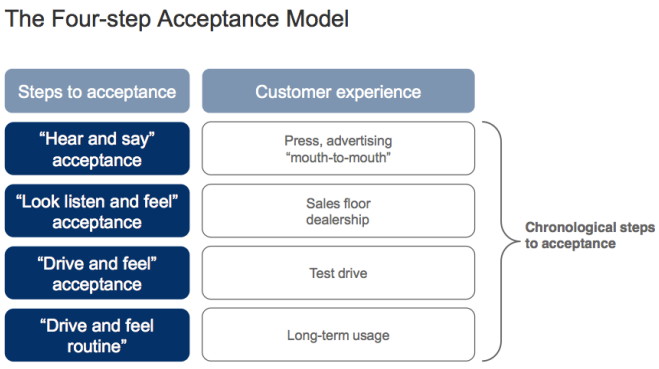
would not say that it is a function. I have no idea about that. But design is important support system in the Company.

Question 5 (MA): Will you categories important factors/perspectives that should be taken in management put a lot of importance in division of strategic map into 5 major zones called financial perspective, customer perspective, internal perspective and learning and growth perspective. Could you name important perspective from a design/new idea generation point of view?

Answer (Company C): We are a customer centric research Company. With our customer research centre with 500 sq. ft of area dedicated to interaction and engagement with chosen customers we aim to get innovation leadership. Apart from consumer focus we have two other important factors we consider, idea focus and product focus.

Question 6 (MA): In the literature strategic maps are work of the business management where design plays no role at all. How do you justify it?

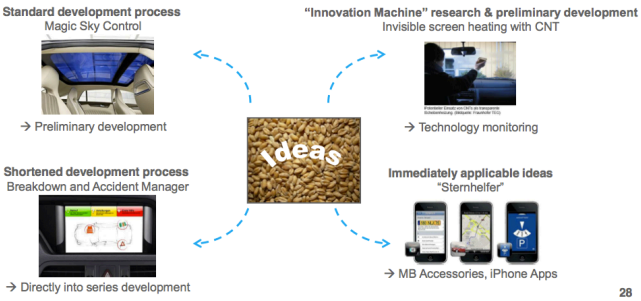
Answer (Company C): Our Company follows fixed rules and regulations. And the process that we follow is pre defined. We have 4 gateways of passing the idea into the innovation funnel. We have rules for ideas to be generated and executed and all ideas cant get through.



Research Approach for Acceptance Steps

Steps to acceptance	Research setting	Research material
"Hear and say" acceptance	Face-to-face interview, online questionnaire	Innovation descriptions in the form of one-pagers, videos…
"Look listen and feel" acceptance	Vehicle lab, tactile lab, acoustic lab, vision lab, showroom	Seat box, components, interior, exterior, stationary vehicle
"Drive and feel" acceptance	Test track, driving simulator	Systems and system prototypes Vehicle prototypes Series production vehicle
"Drive and feel routine"	public road traffic	Series production vehicle Road-legal system

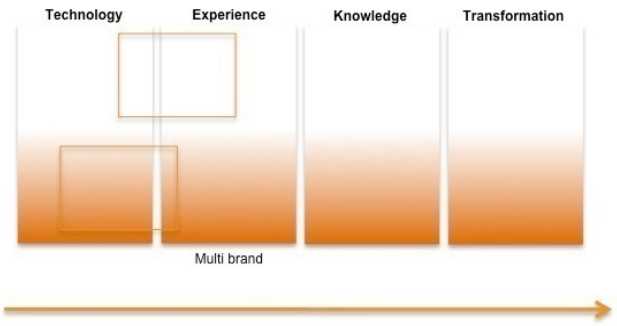
Ideas Are Pursued in a Number of Ways



Question 7 (MA): In literature it is a team effort to perform strategy on the contrary in practice most processes and steps are a single man's idea. How do you think this can be improved? Do you see that as a problem?

Answer (Company C): Its not a single mans idea. It's a process defined by the corporate and the board and it evolves with the everyday activities and changes are made accordingly with proper procedure.

Question 8 (MA): Are you aware of the innovation paradigm theory?



Answer (Company C): Technology and consumer is the core of our business.

Question 9 (MA): There is a visible gap that exists between the thinkers and the practitioners of innovation. Are you aware of that?

Answer (Company C): Heterogeneous teams and good internal communication helps.

Question 10 (MA): Do you think design could help in bridging the gap?

Answer (Company C): We could try.

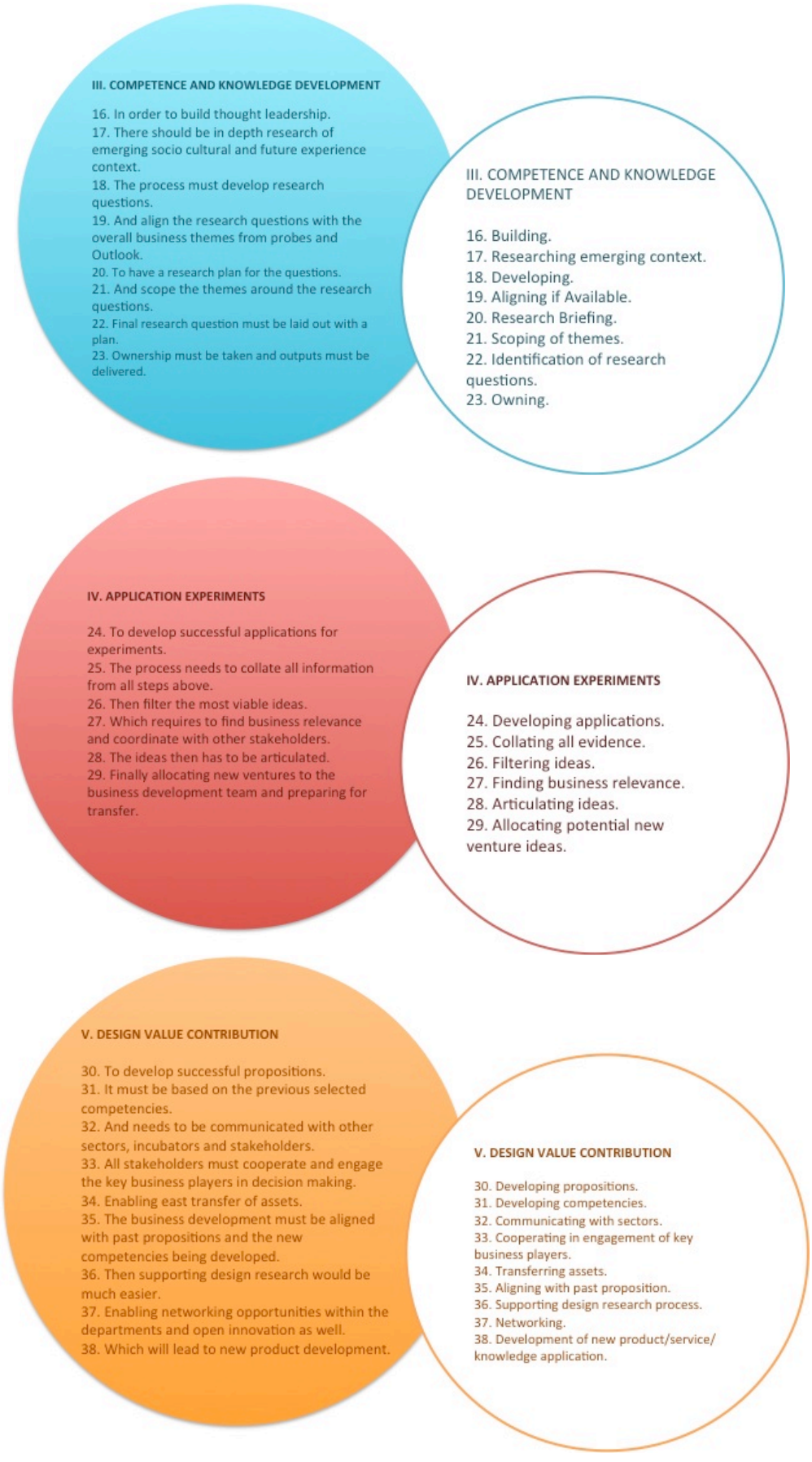
Question 11 (MA): Have you never had a design head in your Company?

Answer (Company C): We do have a head of the Design team. But he is still governed by the Head of customer research.

Question 12 (MA): Would you mind if I quote you in my thesis?

Answer (Company C): No, No problem at all!

APPENDIX 12 – Narrative Corresponding To Each Code In Process Coding.



APPENDIX 13 – Questionnaire For 2nd Third Party Interview.

1. Why are Design practitioners not involved in the making of the process?
2. Why is there not a definitive role definition for individuals within the Design team?
3. Companies say that design individuals are not trained to lead a team. Is this true and if so why?
4. A Leader in a Design team is not necessary for a running of a smooth innovation process. Do you agree?
5. When you say Design to have a role of a functional leader in a company. What do we mean by it?
6. Design has very little chance of being a functional leader in a heavy organisation or technology driven company. It cannot even be a stakeholder but has conformed to the role of a support function or a contract-based agency. How do you think these problems can be addressed? Do they need to be addressed; is it important to be functional lead and why and how is functional lead defined?
7. Design's role in value mapping may or may not be at a strategic level. How can it be justified that value mapping and value proposition makes Design a functional leading discipline?
    a. Engineers tend to make value propositions in technology dependant companies. Do you see Design contributing in any way in heavy industrial goods companies?
8. In most technology driven companies, corporate mission and vision statements are not linked to the position statement of its individual functions. Is it correct to say that aligning a company's position statement with its Design function is the beginning of its role as a functional leading discipline?
9. What are Design competencies in a corporate environment?
    a. How important are they for the role of a functional leader?
    b. Companies who believe in the leadership role of Design do not necessarily talk about development of Design competencies (except Philips Design). Do you think Design can take the role of a leading discipline without developing competencies?

10. Culture directly affects the way people work and the way policies are formed. German companies have rulebooks to fit Design ideas into the corporate production process. Such a policy or process is not seen in other companies. Do you see such policies being acceptable to companies of other cultures as well? If not why not?
11. A lot of politics influence the operation of Design teams in corporations. Do you see Design's political influence being helped if it has a fixed and explicit role defined for it?
12. In the 4/4 matrixes it is seen that Design has a defined role in the lower box where it attends to incremental innovation, and also has a defined role for the box, which refers to breakthrough innovations. But the middle box is where it lacks any role definition. Do you agree with this analysis?
13. Design faces complications in the middle circle in the 4/4 matrix. The middle circle is where business plays most of the role. It is the link of strategy between business and Design that is the toughest to accomplish. Do you see design sharing this role with business?
    a. Do you see Design being able to contend with the limitations of working under strict policies?
    b. Companies have pointed out that this (i.e. working under strict policies) is a problem for designers. Do you think this to be true, if so why?
    c. What will be the consequence if Design does not play any role in the business process?
14. Do you think that a Design team operating at a strategic level should have equal right to play with a company's assets as other disciplines and stakeholders have?
15. Design driven innovation sets out to ignore customer needs, and it is based on customer insights and not on customer needs. But many companies still depend on the analysis of customer needs to actually decide which way their design innovation should go. How can design driven innovation balance the expectation of a corporation to address customer needs?
16. In the navigation matrix the biggest challenge is to identify the strategy that leads to a better zone. Do you think an explicit process can solve this challenge?

APPENDIX 14 – Transcript For 2nd Phase Third Party Interview

Question 1 (MA): Why are Design practitioners not involved in the making of the process?

Answer (SK): I take this as a generic question. Why do they generally not like to do process mapping. I think because designers are generally results driven people. And they are centred on creating solution to a problem and in my experience I found it very difficult specially in the arts and crafts culture in the UK to be conscious of the problem solving or the creative process they are going through so they make there proposals, they make their ideas instinctively as they propose solutions to the problem. And then the manifestation of the solution as a form or a series of things. Aesthetically they can do that instinctively. They know what's a beautiful thing. And the beauty of the form resonates with the idea as a solution to a problem then solution is good. Whether they can analyse and be self conscious of what's going on and that's why design process's are around it to ensure that it happens every time on a timescale and this is not a Designerly thing to do by nature and especially in the English arts and crafts culture. German's can do it, Scandinavians do it, and the Chinese and the Taiwanese seem to be able to do it.

So if you are asking why do they not do it I think its because it not been in their culture, their way of working.

Can they do it?? Some can specially if they have a strong left-brain bent. And probably all could if they were taught to.

Additional comments by the interviewee: With this answer you have summarised the whole of my questionnaire. But lets go into specifics.

Question 2 (MA): Why is there not a definitive role definition for individuals within the Design team?

Answer (SK): I think because design has been running on instinct. Most design consultancies or design team in a consultant team, has someone whether its graphic design communication design, industrial manufacturing design. The team is made up of a person who relates to the client and a person who provides the solution, until recently with BS 8686 in the UK or ISo9002 in the 80's until then I didn't even here as a recognition if there was a project manager who was separate from the designer. So that would have been the third role the well known triangulation role at Philips Design. Within the team creating a solution the content team because the solutions were quiet simple like design a better object or design a better advert. In Industrial design anyway the team was made-up of lots of similar people working on different aspects of the solution. There was not a technologist, a form giver, a phycoscientist, and anthropologist, a business modeller etc. there were not different disciplines working together as if there would be in architecture or even in communication design where in advertising typically there was a creative director who did the layout of the words and the images and the copywriter who gave meaning to the words. That was always a team of two with an account manager there was an always a team of three and then their was a media buyer who always made sure the adverts were placed.

Industrial design did not have these teams; it was a team of one. I meet a client, I understand a problem, I provide the solution, I give it form and I sell it. And this was done instinctively.

What we all discovered at Philips Design was that these problems were enormous and involved bringing together technologists, marketers, aesthetics, communication scientists, and business developers. We were actually looking at designing much better systems of things rather than changing the front door of the washing machine, which could be done with one person.

Question 3 (MA): Companies say that design individuals are not trained to lead a team. Is this true and if so why?

Answer (SK): I agree to that's what they see. But that's what is happening? (Pondering)

Yeah, I believe in my experience here in the last two years that's what is happening. The people are people who used to be single person problem solvers in the past generation are teaching students in the worst case and they are teaching students to do what they did. They are not teaching project management, not teaching client management, not teaching knowledge integration, and they are not teaching understanding the customer, they are not teaching all the other things that make up the full portfolio of a 40 year old designer today needs. They are not teaching how to have an idea, they are assuming that people have ideas instinctively, they teach them how to give them form so that the ideas are expressed beautifully in a graphic design language or in an industrial design language, or three dimensional design language. Because they simply don't realise that the employees need different types of skills. So the Eindhoven plan that we worked on was set up on a completely different premise, it was setup knowing that organisation wants a completely different type of person, a different type of designer, and so they made those competence framework, so that everybody who left would be able to integrate all skills, would be able to project managing, would be bale to talk to organisation, would be able to understand the systemic problem, would know how o lay to a plan, would know how to integrate technology, would know how to have an idea within a group, sort all problem and give it a beautiful form. But because they were not giving it 2000 hours per year of form giving practice, the beauty of their expression was nowhere near that high as to someone who does spend those 2000 hour an year on that one aspect but they are not great team leaders, they are not project managers. Here we do it through the MA programme, or some of the MA programme, but then we end up not doing the formwork in the MA programme. I believe there is a way of having both, especially if you are an undergraduate. Undergraduate programme is built on design articulation as we call it, where in the masters you learn how to manage it.

I remember 20 years ago with royal college of arts people said that future employers or current employers and studio managers wanted people who could give great form and that's all they wanted. Where as people had started to teach designers strategic leadership to them from a creative approach and I noticed that even apple as an employer I cant prove it but

sure I heard, maybe it happened in Philips design. I heard at apple last year, we don't want storytellers we want people who can design. We will do the storytelling we want you to give it form, but if you absolutely declare that's what you want then that's absolutely fine. But to do that you need to be clear about it, which need to know what the spectrum of possibility is so that you can choose your particular type of person you want.

Comment (MA): Buts its kind of unacceptable to see when we did at Philips Design is but in companies like Company B and bombardier, engineers do it! And in Mercedes Benz all these insights are being collected and strategized by philosophers, philologists and design is nowhere so its kid of hard to believe and accept it.

Explanation (SK): To do so all four groups should be involved from the beginning. Probably becomes expensive in the process but is cheaper because the solutions now fit.

It is possible that any other groups could do it and one of the four groups could do it. From historical point of view, the technologists did it first then the marketing people did it second and then the management consultant did it third and now they are suggesting designers should lead. If one of them lead and they suggest that the other become subcontractors to it is still going to be wrong. Somehow the four have to be there one of them have to chair, but they have to be given equal weighting. That's my view. I hope I am not naïve about it but I have watched from the 20th century where technology went first, then marketing, then business management and now designs having a go.

Comment (MA): I think this decision is also based on budgeting of the company. Technology if it gets more budgets then it has more power.

Answer: Yes. True!

Question 4 (MA): A Leader in a Design team is not necessary for a running of a smooth innovation process. Do you agree?

Answer (SK): Yes. (Silence)

Process is not self-fulfilling. There was a problem that we all had and Paul and I used to tear each others hair out, is that following the process does not happen if there is not anyone to lead you to the process. Then you are back to u do need a leader. People do not comply with process naturally specially designers because of the answer I gave previously. Having a process is good, scaffolding but you are going to make sure its connected to the building (laughs) and that requires a leadership.

Comment (MA): I can give you leads here. Company A completely disagrees with this. They think leader is not important. If you have self motivated people.

Answer (SK): All self-motivated people are then all leaders? If they are all self-propelling, but it is not possible to have 200,000 people who are completely self-propelling who will all follow the process we discovered that here. You need leadership, I know designers hate to be lead but I do know that when they are not they complain bitterly about lack of leadership. I have never heard a group of people complaining more about lack of leadership than designers. You never hear academics complaining about leadership because they don't want any whereas designers crave it and yet when its there they hate it. Because they see control as an amazing paradox.

It depends who you asked the question to whether they believe the world is run on its own engine in other words the process does not have to drive everything or you believe that everything is run by the relationships of people. If you believe in the relationships of power of the people as I do then leadership is essential. If you believe processes and we are all widgets in a machine then we will just do it as we are programmed to then you are bound to give a Company A answer.

I don't know whether its Company A's point of view as an organisation or is it that particular persons point of view. Then that could say a lot about the persons view ad their understanding of what motivates human being to do something.

Question 5 (MA): When you say Design to have a role of a functional leader in a company. What do we mean by it?

Answer (SK): It means that design is seen as one of the functions of a company by technology, business or marketing. And it is one of the core functions of the company. And if you recognise that then their needs to be an internal team who represent and ensure that that function is utilised properly.

If HRM, Accountancy, information technology, financial control these are all functions of any company just like the human body you need arms, eyes, legs, mouth all the core functions in order to be human. If you acknowledge design, as one of them then it needs to be managed and instituted in such a way that it can run like that and if you don't believe it really does not matter.

Question 6 (MA): Design has very little chance of being a functional leader in a heavy organisation or technology driven company. It cannot even be a stakeholder but has conformed to the role of a support function or a contract-based agency. How do you think these problems can be addressed? Do they need to be addressed; is it important to be functional lead and why and how is functional lead defined?

Answer (SK): It is only a problem when the technology company is trying to move to a different horizon from horizon 2 to horizon 3 scopes. If a technology company is very happy delivering a types of technology as a service as it has always done for the last 50 years of its life then it does not need to think about what it is going to be doing in the future, it doe not need to design a function to plan that potential future to find out what the needs of people are, what the needs of the market place are, what their technology scope might be, but in every company in history has discovered has a natural lifecycle where a technology is suited by a new one .

The new technology or technique of doing something is got to be demanded by people and on what form that technique is in/technology is a design problem and how it relates to people who can use it, whether its an

industrial machinery or a domestic machinery or personal wall machinery like telephone. It is only not a problem if you stay in the same technology space that you have always been in. But somebody somewhere is making those design decisions. Even if it is making electric motors that go inside a car started motor system someone is working at how to install them, someone is working towards how to wire them up, someone's working to make sure that the wiring goes on and connects properly, someone's working at how they can be changed if the motor breaks, those are all design problems. And there are also the higher aesthetics like starting the car with a key or a pad or a push of a button or a code. And they are all there if you need to start a motor at all.

Question 7 (MA): Design's role in value mapping may or may not be at a strategic level. How can it be justified that value mapping and value proposition makes Design a functional leading discipline? Engineers tend to make value propositions in technology dependant companies. Do you see Design contributing in any way in heavy industrial goods companies?

Answer (SK): Anyone can do these mappings. It does not take designers to do value mapping, which means to access what the business value ifs out there, and what the values of people are and see what the connections are. Anyone can do that.

What designers do is that, when they are in the team at the beginning, they bring their insights as to how they understand people together with the ethnographers, they also can start to imagine what an application of the technology in a particular context to respond to those value of people in that business value space so that they can test out the idea. In fact the designers have understood the connections between all those and this is what ends up pushing them in the lead but it does not need to be what we call a traditional industrial designer to lead that process, anyone could lead it if they understood it and wanted to do it that way. It just happens that designers do understand it and do want to lead it that way. But that's not the Designerly bit of the designer that the connectivity part of the designer bringing the different disciplines together to solve the bigger picture problem.

So yes it was done in Philips design more than it was done in Philips technology or more than it was done in even in Philips marketing because of the way the design had the technologists, members of the marketing intelligence community, members of the business development team of the company and designers working on it together. When the proposition, the idea/application idea was proposed we knew it would land.

Comment (MA): In some German companies the design team has set of rules to fit the ideas into the business of manufacturing. Like Mercedese Benz has a strategic rules book for all their ideas to be put in the mainstream of production line.

Answer (SK): I winder how these smart cars fitted in that? I wonder if the rules are they're to stop the ship going off the course and yet when someone throws in an idea like 'Mercedes swatch mart car' idea probably breaking all those rules and yet they let it through. Smart being collaboration between Mercedes and swatch. http://en.wikipedia.org/wiki/Smart_(automobile)

If the Germans though have those strict rules that nobody could break them I suspect they are probably their to protect them from going off the rail and yet if something comes in from the left field as they call it they still manage to respond because all sort of wonderful things happen. Like BMW…. Did they know mini was coming into their hands…no!

What I am trying to say is that kind of all these rules and regulations when a smart idea comes along you have to take it on board. The rules are they're to protect silly things and they are not there to kill the smart ones.

How do you validate, how do you monitor? The Josephine green approach is that there is a 1000 flowers bloom so everything grows some naturally die and some naturally go forward. So if we protecting delicate ideas. The other approach is 'throwing spaghetti on the wall and see which one stick' that's no management at all.

Comment (MA): Its kind of how Paul works.

Explanation (SK): Yes. And that's why Abby was so upset she should not work with him. He was just so upset that even if you let everything go there is no view of leadership at all. But the German approach is that we would funnel everything, and then what do we do with the one that goes through? The one that good idea that wont let up, the Dutch expression of that won't slow down, it will keep reappearing, that's a dimer!

Are you going to end up with conclusions?

Question 8 (MA): In most technology driven companies, corporate mission and vision statements are not linked to the position statement of its individual functions. Is it correct to say that aligning a company's position statement with its design function is the beginning of its role as a functional leading discipline?

Answer (SK): This is important for design to be recognised as a function yes. I think this is important for the nature of that function in the corporateness, in the body of the company is aligned to the company's official brand promise otherwise its two different organisations. That's because I believe in the role of the body, rather than the role of the self. So yes.

Question 9 (MA): What are design competencies in a corporate environment?
How important are they for the role of a functional leader?
Companies who believe in the leadership role of Design do not necessarily talk about development of Design competencies (except Philips Design). Do you think Design can take the role of a leading discipline without developing competencies?

Answer (SK): That's a huge question. We spent 10 years at Philips Design working on it. The competencies actually are like curiosity, and questioning and seeing things in a different point of view, the characteristics of creative people but the competencies are listed.

The most important thing is to know what they are and that you are completely defined about it and completely open about it. Then you have the difference between them. For instance if you take the people research competencies, being aware of people and understanding the needs of the people in a design idea where is the competence of people awareness is it in the marketing department, is it in the technology department is it in the design department? The thing is they are all overlapping each other. So we know that in understanding people you have to understand people in such a way to guide the technology drive into understand the way we do marketing, to sell and to communicate with them, and the way we design things that meet their capabilities physically, mentally of the people the way in ergonomics and phyconomics.

So the most important thing is to know where these overlaps are in the company. You don't end up with people, research, and technology and design fighting each other.

That's quiet an interesting and an insightful question. (Takes out a sheet to draw his thoughts).

So there is a bit of people research in technology, there is a bit in business, and there is a bit in aesthetics. So you need three types of people researches. As there are marketing people for people research in technology, these are the philologists in the business and ergonomists in design. The problem is to keep them working together.

Comment (MA): Who makes these decisions?

Explanation (SK): As to where those competencies are? It should be the CMO (chief marketing officer or the chief people research/ chief functional lead for people. And what happens at Philips what that it was all here (the dots).

If we make one of them the chair it will not work:

But more like is very less of these functions alone or separate. They are all joint.

Either it's happening by discreet people or technologists who are doing it by guesswork. That answers the first half of the question as to how design got away with it, they didn't get away with guesswork but intuition. Having done it so many times before they were right it would look as though they were guessing but it's actually' trust me I am a designer'. And they probably were right enlightened and technologists were also probably right, great business people like Dyson Branson (the Virgin man), is right because he naturally relates to people, and he naturally has the design aesthetic.

Comment (MA): but how many have it?

Answer (SK): Not very many. How many Leonardo Da Vinci's do we have…these are the Leonardo's' in the end.

Universities are set up far separated from each other.

We need to be like figure 3. And if Leonardo started it and it has been 500 years since then and it has not happened yet. People naturally go to this world. We are saying there are four, but there might be more.

Reon Brand used to talk about:
S – sociology with People.
T – Technology with Technology.
R – Religion with People.
E – Economics with Business.
E – Ethics in People.
P – Politics in People.

Then what's the point in Design? Well to give all that a form. Because that's actually what we make. Otherwise this table would not exists it would be a technological human construct, it would be an abstract. A flat surface with four legs made for people to talk to each other around it. That would be the

only language to describing it. Actually the drawing that became this is the language that describes it as table.

Question 10 (MA): Culture directly affects the way people work and the way policies are formed. German companies have rulebooks to fit Design ideas into the corporate production process. Such a policy or process is not seen in other companies. Do you see such policies being acceptable to companies of other cultures as well? If not why not?

Answer (SK): Yes. But with anyone that is similar. (Smiles)
I can imagine the Chinese or the Japanese working very closely to the principle, which is made explicit by being written down.

Countries like Uk where everything bumbles along and happens as it happens and its negotiated the difference between Napoleonic law which is German law or French law where everything is written in a book, Napoleonic law and case law which is things happen by reflecting on the consequences of what happened before, are two different manifestation of two completely different learning cultures.

It all comes down to what does one mean by the word culture? When we use the worked culture as a scientific thing, a culture is when seeds in a context as in atmosphere connect and grows into a thing.

You can see a culture of a fungi, and we have words to describe its culture, when you grow a culture the culture is the stuff that grows on it and that's the culture manifestation. Because we are not in it we can see this culture this froth growing. Human beings in a culture cant see their own froth because they are in it; they are an element on it. So yes if you throw a foreign body into that culture it would affect it positively/negatively but certainly affect it and therefore create a new, changed culture. Expressions of that culture are through the behaviour, the music, the art through the dance, writing, through the way they set up rules for making future happen, through police, through the way they run their roads and transport but is driven by the context which is ijn it. So an Arabic culture in a dessert is a completely different one for us on four wheels in Europe.

Question 11 (MA): A lot of politics influence the operation of Design teams in corporations. Do you see Design's political influence being helped if it has a fixed and explicit role defined for it?

Answer (SK): Yes. Because it is not recognised in our cultures. In Italy it was always recognised. Italian design houses go right back to the 15th century, the renaissance had design all the Leonardo's and Michelangelo's because every king had an architect. Architect was just not the designer of the building of the palaces but he actually designed the whole culture and society. The put buildings up to trigger change to show power. The designers wont working for the benefit of the society they were working for the benefit of the kings to control the society through the design of the buildings, through the design of the amphitheatre, through design of the roads, through the design of the walls around it. Architects always work like this.

Fixing the role of design is a way of showing value of design to the members of that culture, so yes. Its one of the ways of doing that.

Comment (MA): I any other way you can think of?

Explanation (SK): No. Maybe continuously showing them the value of design. Maybe there are a lot of ways to do that. The role of the culture like Italy's, which is capable of equally valuing the role of maths; music etc is a part of that culture. But we are in a tutonic, which is a pragmatic culture of making and problem solving without the design and aesthetics sensitivities to it. Our whole disposition is about manufacturing, engineering and the non-deceiving part of work ship. They don't see value in poetic expression, thoughtfulness of things.

Question 12 (MA): In the 4/4 matrixes it is seen that Design has a defined role in the lower box where it attends to incremental innovation, and also has a defined role for the box, which refers to breakthrough innovations. But the middle box is where it lacks any role definition. Do you agree with this analysis?

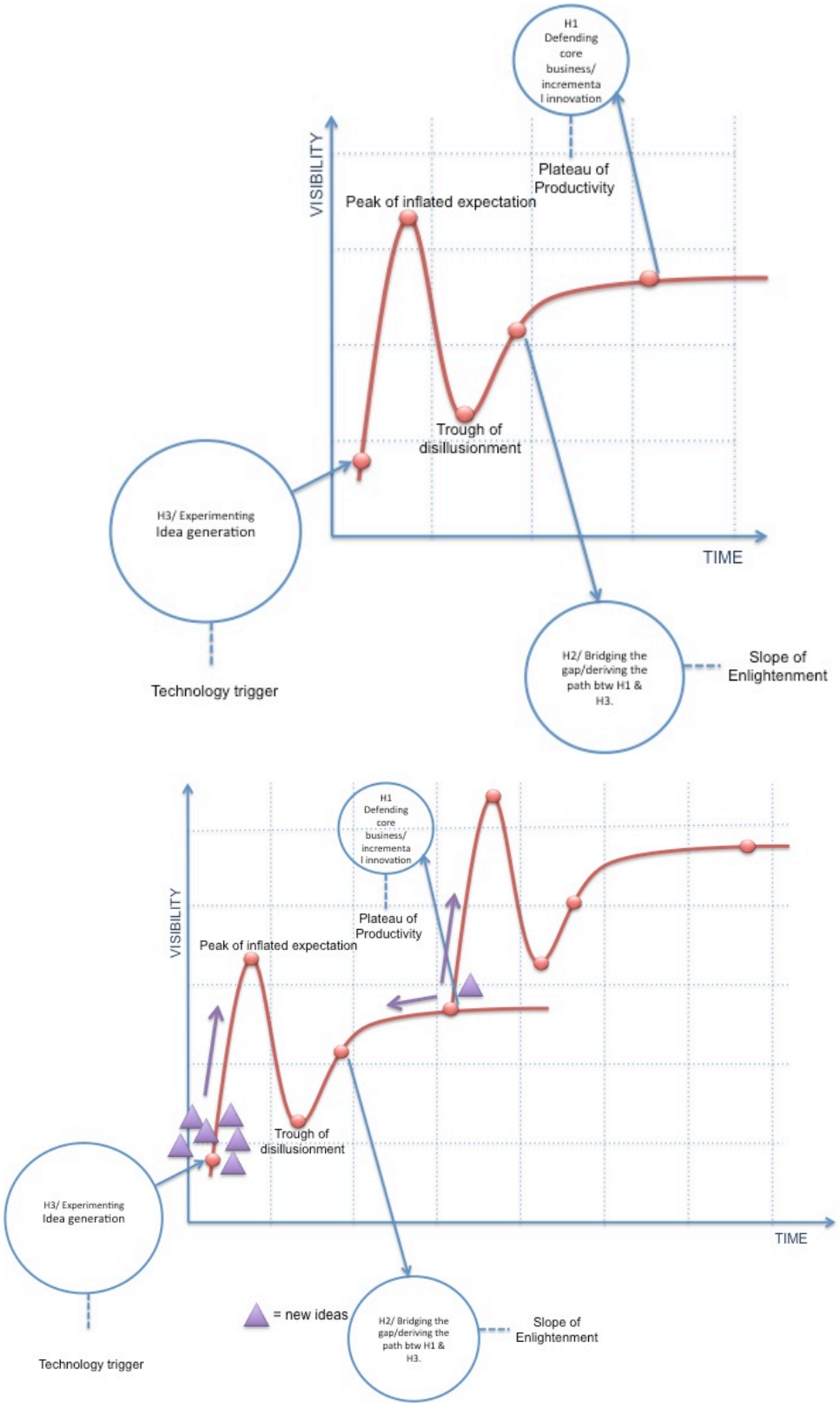
Design faces complications in the middle circle in the 4/4 matrixes. The middle circle is where business plays most of the role. It is the link of strategy between business and Design that is the toughest to accomplish. Do you see design sharing this role with business?

a. Do you see Design being able to contend with the limitations of working under strict policies?
b. Companies have pointed out that this (i.e. working under strict policies) is a problem for designers. Do you think this to be true, if so why?
c. What will be the consequence if Design does not play any role in the business process?

Answer (SK): Yes. Middle circle is about bridging the gap. And it's very hard. In terms of the rigger they should all do it together. In the middle circle everything is so fixed that it's almost like you are free again. For me the challenge is, is this about moving from lower circle to upper circle, or upper circles to lower circle in other words expanding based on the current premise or is it about building the bridge top bottom. So is it breakthrough circle in the lead pulling it towards itself or is it at incremental trying to build on and push outwards. I think it's hard to up and push other than push downwards.

Getting people to agree with us where you want to go is very hard. So it's easier to almost spread out along with policies and rules. And designers will kind of have to if we want to be recognised. Its very rigorous because it's more engineer, controlled, programmed and predictive.

You either programmes it using these premises (upper circle) or you programme it to deliver (incremental).



Question 13 (MA): Do you think that a Design team operating at a strategic level should have equal right to play with a company's assets as other disciplines and stakeholders have?

Answer (SK): It has never been that way. I managed to get it and we used a lot of company assets driven by me. Stefano was not able to make it happen. Rick Harwick let me do it. The TO: DO: SO approach was driven by design.

But somehow those people who did it could not get other technology and business people to do it. Stefano instituted them to do this but it did not happen till Rick Harwick was not on board. These things were never seen as a Philips design thing even though it was.

Question 14 (MA): Design driven innovation sets out to ignore customer needs, and it is based on customer insights and not on customer needs. But many companies still depend on the analysis of customer needs to actually decide which way their design innovation should go. How can design driven innovation balance the expectation of a corporation to address customer needs?

Answer (SK): It's a semantic issue. Insight the way I understood it was an insights to the needs for the customers. I don't know how these words are used in other companies; it's more of a semantic issue. For me Insights is more of a qualitative interpretation of the actual factual tutonic needs of a person. So it's the softer issues rather than the engineering need of an airline pilot with an eye for flicker on as to how much information is displayed in front or at the right is a phyco science need about the ability of the mind to process the images while flying a plane on 30,000 feet.

Designers can recognise things and create insight from it. Anyone with a good insight can do it. The designers are trained in a certain way to juggle all these different attributes and do it so I think its just a semantic complication between the role of human need.

Insight is about how you interpret the needs and make a collective solution to something. So if we talk about the chess players like the daughter of Mikhail Chigorin (1850-1908), she could look at things and have insights into what was going on and replay and when it was actually not properly patterned it was just noise and she could read that and I think that's what we are trying to do instinctively. Maybe she has got some amazing memory but she was an average in the IQ tests.

http://www.chessintranslation.com/2010/08/the-forgotten-recollections-of-chigorins-daughter/

Question 15 (MA): In the navigation matrix the biggest challenge is to identify the strategy that leads to a better zone. Do you think an explicit process can solve this challenge?

Answer (SK): Yes. It does help. Because it's scaffolding, which helped in putting these small ideas, so you know in this case whether they are actually communicating an idea/value in the horizon. It was an analysis tool to look at an idea and the form it has been given and see whether the idea itself had a value in the long term or the short term or what type of value it had. I think it was a very useful tool.

APPENDIX 15 - Coding For Third Party Interview 1.

Third party interview Descriptive coding.

DATE : 10th June 2010

CODE: Third party interview 1

Response 1: Apart from the one [1]Paul Gardien got called new design, in design, which is an international design journal, Verganti. But basically there is very little information.
Response 2: [2]No ones really mapping the content being innovated, or the changing world to which the new content and ideas are being brought. [3]And how that is being innovating both ways the company operates and the services that it offers or the world that it touches [4]that is not being mapped. In order to proof the values that is being offered and the values to which they are responding.
Response 3: [5]We tried it in innovation architecture.
Response 4: [6]There are no true axioms on proces[7]What we are trying to do in the deSform process is to try to get the people together who are working on new methods or new ways of working that could be seen as scientific principles that would always guarantee results. It's just possible that it doesn't seem to exist in design led innovation. So much in dependant on energy, commitment, passions, which can be followed.
Response 5: [8]Making new thing happen in a new way to a new world, which is our innovation, may not be capable, or worthy of being possible to deconstruct it.
Response 6: [9]The gap is between a pull from 5-10 years in front dragging people towards them and a need of a designer and a product developmental cycle in the trying to get out the new MP3 players.
Response 7: [10]But many people were not committed to that.
Response 8: [11]" I am a designer and I don't know how I should articulate so that it's valuable to you or to the company but I know its right, there fore keep funding me."
Response 9:[12] But money for what though?
Response 10: [13]Money for me to be me!
Response 11: [14]But then it seems the communication wasn't happening. So it was being broadcast but it wasn't being received.
Response 12: [15]Whether it was not happening was because the people were week, they were ignorant of it or they deliberately sabotaged it. Week as in it was difficult, they could not handle it or whether it was sabotaged, or just ignored.
Response 13: [16]self is the only reference point and multi stakeholder point of view as the only external reference point, then it doesn't work. Because you are your reference point.
Response 14: [17]And everyone else is their own reference points so common goal has no generosity or you don't have a generosity towards common goal.
Response 15: [18]Northern Europe as a culture developed the cooperative. Like farmers cooperatives, the whole Dutch system is where mediating through each other does work.
Response 16: [19]So there is some sense in human beings in here that they want to do that but somehow our nature stops it. We have to overcome that nature in order to achieve what we know is right.
Response 17: [20]The question is does anyone value the assessment of the auditors?

[1]LITTLE INFORMATION ABOUT DESIGN.
[2]NO DESIGN MAPPING.
[3]NO INOVATION MAPPING.
[4]NO MAPPING OF DESIGN VALUES.
[5]TYPES OF MAPPING.
[6]NO TRUE PROCESS.
[7]PUBLICATION ARE BEING MADE.
[8]DESIGN PROCESS CANNOT BE DEFINED.
[9]EXISTENCE OF A GAP.
[10]LACK OF COMMITMENT.
[11]PROBLEM OF DESIGNER ATTITUDE.
[12]BUDGET FOR DESIGNERS.
[13]PROBLEM OF ARTICULATING VALUE.
[14]PROBLEM IN COMMUNICATING DESIGN VALUE.
[15]EGO AGAINST DESIGN.
[16]POWER OF SELF/ME OVER OTHERS.
[17]LACK OF COMMON GOAL.
[18]COOPERATIVE CONCEPT vs. STAKEHOLDER.
[19]INFLUENCE OF HUMAN NATURE ON WORK.
[20]LACK OF INTEREST OF DESIGNERS ON VALUE ASSESMENT (AUDIT).

DATE : 10th June 2010

CODE: Third party interview 1

Response 18: [21]They jump through all these loops in a particular way, and you know you are never going to do it.
Response 19: [22]And if the decision you take is that you are never going to jump within the loops anyway then why not construct a complete false environment and then not comply with it later.
Response 20: [23]No, there are many processes.
Response 21: [24]Everybody follows a slightly different one. Because as you are saying the triggers that gives you ideas are according to you and your mood, the problem, the people you are with, the time.
Response 22: [25]So there is no predictable path from question to answer.
Response 23: [26]The research questions are open and you might discover many things to tell you that that research question was not the right one.
Response 24: [27]And that's called post rationalization.
Response 25: [28]We have these processes so that when it all gets flimsy and you loose energy and you start to panic and you wonder whether you are wasting money and you know whether you are getting no where and you loose confidence in hat you are ding you have a structure that says, no its ok.
Response 26: [29]SO it's a way of enabling you to stop and in what you are doing and find a value in it.
Response 27: [30]So its like a structure.
Response 28: [31]or a scaffolding.
Response 29: [32]That helps you monitor and value what you have actually got in relation to the starting point and how it has changed.
Response 30: [33]Not in order to find business, if one came out good if it didn't that's al right. At least they new that it was a signal that was a sign of not anything that was actually going to be of value to them right now but might be a value in future.
Response 31: [34]But it is a signal, a sign of something that represent value or meaning of something, somewhere. So, is that meaning that we can bring more to life, is that sign that we could exploit, respond to, contribute to.
Response 32: [35]These structures are not control structures.
Response 33: [36]Designers feel threatened by the control systems.
Response 34: [37]I don't see massively shifted here.
Response 35: [38]These processes are happening simultaneously in the minds of a person it can be restructured and deconstructed for the review of the auditors.
Response 36: [39]The only thing I noticed is that this is the Philips design part of it. I don't see the part where it connects to the marketing, strategy, technology part and the sector bit of it.
Response 37: [40]I don't know why wouldn't they accept it from there heart but one of the reasons could be that it wasn't a reality for them.
Response 38: [41]They didn't know that that was the purpose.
Response 39: [42]Because they didn't share their problem? Because their daily problem, their personal self centred problem that they were employed to solve.

[21]DESGNERS ARE NON COMPLIANT TO RULES (AUDIT).
[22]DESIGNERS ARE STUBBORN.
[23]EVIDENCE OF MANY PROCESSES.
[24]NO ONE FOLLOWS ONE PROCESS.
[25]UNPREDICTABLE PATH.
[26]NO NOTION OF WRONG OR RIGHT.
[27]DESIGNERS USE POSTRATIONALISATION.
[28]PROCESS EXISTS TO SUPPORT.
[29]PROCESS HELPS IN FINDING VALUE.
[30]PROCESS IS A STRUCTURE.
[31]PROCESS IS A SCAFFOLDING.
[32]MONITOR VALUE THAT HAS BEEN ACHIEVED.
[33]PROBE TO FIND HIDDEN VALUE.
[34]PROBE TO PROVIDE A SIGN.
[35]STRUCTURED ARE NOT TO CONTROL.
[36]DESIGNERS DON'T LIKE CONTROL.
[37]PROCESS REMANIED THE SAME ON PAPER.
[38]PROCESS KEEP EVOLVING IN THE MIND AND ACTION.
[39]PROCESS NOT WELL CONNECTED GRAPHICALLY.
[40]PRACTITIONERS LACK OF INETREST IN FOLLOWING THE PROCESS.
[41]LACK OF UNDERSTANDING OF PURPOSE OF THE PROCESS BY PRACTITIONERS.
[42]LACK OF SHARING OF PROBLEM BY PRACTITIONERS.

DATE : 10th June 2010

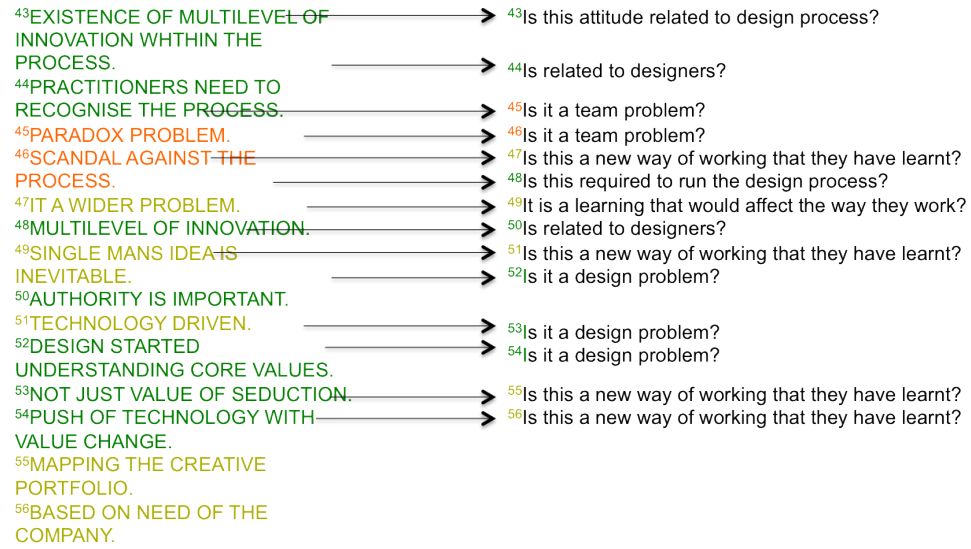
CODE: Third party interview 1

Response 40: [43]By getting them to realize or make them see them selves in a bigger team that will take the company from today to the next 20 years like 2020 or 2030. There are few people plotting the world for 2030, some for 2020, some for 2010 while all will be a part of one community.
Response 41: [44]Moreover, they don't need to accept the process they need to recognize it. Most people are doing it in their own lives. Most of them are trying to get to tomorrow.
Response 42: [45]It is a paradox.
Response 43: [46]A scandal.
Response 44: [47]I don't think it's a Philips design problem.
Response 45: [48]You can innovate 10 levels simultaneously and you can innovate three horizons simultaneously. So certainly you have got a Cartesian level of matrix of 30 different options to manage simultaneously over in their case for 10,000 people.
Response 46: [49]Well I think it is inevitable. If you take the worldview that everybody is in the centre of his or her universe it is inevitable that this would happen. If that is human nature. Self-preservation then in an instinct it is not helping the group.
Response 47: [50]So companies use the people in Paul's position so try to keep the people together and focused on the community development rather than them having their personal ego's to dominate.
Response 48: [51]Philips admitted that it was technology driven for many years. Stefano became one of the people in Philips who tried to see the need of the people first rather than the want.
Response 49: [52]So that we would understand the core values.
Response 50: [53]rather than the values driven by seduction.
Response 51: [54]So while we are changing from one world to another there is bound to be a residue of the push of technology as well.
Response 51: [55]You can't cater to all of them so you have to select a few to respond to, and be confident about that they were good enough, and make sound choices. So the portfolio selected was a kind of mapping. That is how do you decide on behalf of your shareholders, staff, investors, clients, to cater to the health and well being issue and not entertainment or not doing hospital or home or decision not to do anything with the life on a move.
Response 52: [56]We mapped it according to the need of the company to make a selective portfolio.

[43]EXISTENCE OF MULTILEVEL OF INNOVATION WHTHIN THE PROCESS.
[44]PRACTITIONERS NEED TO RECOGNISE THE PROCESS.
[45]PARADOX PROBLEM.
[46]SCANDAL AGAINST THE PROCESS.
[47]IT A WINDER PROBLEM.
[48]MULTILEVEL OF INNOVATION.
[49]SINGLE MANS IDEA IS INEVITABLE.
[50]AUTHORITY IS IMPORTANT.
[51]TECHNOLOGY DRIVEN.
[52]DESIGN STARTED UNDERSTANDING CORE VALUES.
[53]NOT JUST VALUE OF SEDUCTION.
[54]PUSH OF TECHNOLOGY WITH VALUE CHANGE.
[55]MAPPING THE CREATIVE PORTFOLIO.
[56]BASED ON NEED OF THE COMPANY.

APPENDIX 16 – Putting Codes Into Themes.

Putting Descriptive coding into its themes.



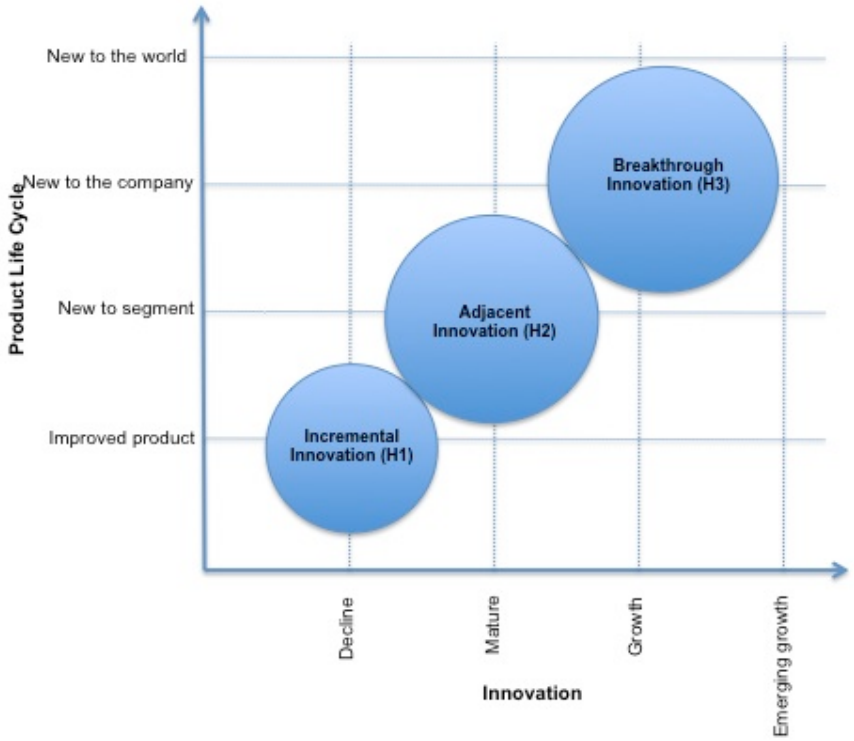
APPENDIX 17 – Matrix Highlighting Important Factors Required For Design, If It Has To Be Established As A Functional Leader.

Categories	Philips	Company A	Company C	Company B
Knowledge Competencies	✓ There is a wide gap between thinkers and practitioners in the design team. ✓ Brand Driven Company. ✓ Strategy based on experience context. ✓ Strategy based on strong position statement. ✓ Use of marketing platforms to justify the Design strategy. ✓ A sound innovation architecture defines the role of design in the business. ✓ Design team develops strong competencies for design, which later integrates into business. ✓ Use of horizon theory to explain the gap and problems. ✓ A process to differentiate between noise and weak signals for future value exploration. ✓ An explicit process for design strategy. ✓ The matrix system solves the purpose of	✓ Design works from Company A research centre. ✓ Design bases itself with a well-defined mission and vision statement from the company. ✓ Believes that leadership is not necessary, creative and disciplined people can run a process successfully. ✓ All departments are well integrated to Design. ✓ Design to work very closely with the CTO (Chief Technology officer). ✓ Successful process is all about taking the journey together. ✓ Design to work beyond the broad themes that the NRC works and become an inspiration to the company. ✓ The strategy of the company is well integrated with design. ✓ Explicit thinking of the following: Trust = freedom	✓ Design to make the company show its brand driven. ✓ Deign as a support function. ✓ Design has a role of styling the products. ✓ Research and technology is central to the organisation. ✓ Research & Technology is the function helping business units very closely. ✓ Focus predominantly on customers. ✓ Use of different kinds of brainstorming and creative exercises to come up with future prospects. ✓ Communicatio n lacks between business units, other functions and corporate. ✓ Existence of a rulebook to push design ideas to the corporate. ✓ The consumer research centre does the central research.	✓ Aircraft manufacturing company where technology is very close to its heart. ✓ The company is technology lead. ✓ There is a gap between thinkers and practitioners. ✓ Design and simulation studio run by technologists. ✓ Employees have to be engaged internally. ✓ The company works on 4 concrete themes for 2050 in their creative portfolio. ✓ Company to raise incentives to involve employees in the innovation process. ✓ Two parallel innovation process run: the cabin innovation with life span of 1-3 years and aircraft innovation process with a life span of 15-20 years. ✓ Works around three stakeholders predominantly: Customer, airlines and internal.

	Design driven innovation. ✓ Navigation within the matrix is a challenging task.	Freedom=Creativity Creativity=innovation.		
Design competencies	✓ Role of design to provide Value proposition. ✓ There is a lack of understanding of value of design in the company and also among the team. ✓ There is a lot of politics that goes against the design team. ✓ Lack of awareness of design in the company. ✓ Integration of design into business poses a lot of complications. ✓ Design can lead as a function with an explicit process.	✓ Role of design used for value mapping for the company. ✓ Design is used as an inspiration. ✓ There is no requirement of an explicit process. ✓ Designers to get more rights to play with the assets of the company. ✓ Design team should have a well-defined role in the company. ✓ The company should reflect a definitive goal as well. ✓ The corporate culture should be helpful for design. ✓ The law of positive exploitation by design. ✓ Explorative development by design. ✓ Design should create future scenarios.	✓ Role of design to make the product styling depict brand identity. ✓ Design as an agent, which reminds the customer's brain about the brand identity. ✓ Design as a guarantee for sustainability of the products. ✓ Design to keep the individuality of the products. ✓ Design to bring distinctive brand identity. ✓ Role of design is predominant in the styling and body of the car. ✓ Design to make sure the products are a part of the gene pool.	✓ Design plays the role of a support function. ✓ Design as a support function. ✓ Design to have a well-defined function. ✓ Design unlikely to have a role of a functional lead. ✓ Designers not have the skills to lead a team or a company. ✓ Design to take a customer centric approach. ✓ Designer cannot lead a team.
Team Competencies	✓ There are issues of ownership of the process by the practitioners in the design team. ✓ Practitioners are not involved in the process development. ✓ The team is multidisciplinary. ✓ The process	✓ The team is multidisciplinary. ✓ One of the problems is the non-descriptive role of a leader. ✓ One of the solutions is a good team and then their wont is the requirement for a leader. ✓ There has to be a well laid out experience	✓ The corporate team to develop a culture for design team to work comfortably. ✓ Multidisciplinary teams. ✓ Customer research headed by philosophers. ✓ Well-defined roles for all teams in the company.	✓ Focus is put on teamwork. ✓ Strict company training policy for employees. ✓ Training and guidance can lead a team to work well. ✓ Multidisciplinary team.

	description is a single mans idea. ✓ Well-defined team competencies for the design team.	platform for future explorations.		

APPENDIX 18 - Relativity Between Philips Design And Other Company's Innovation Types.



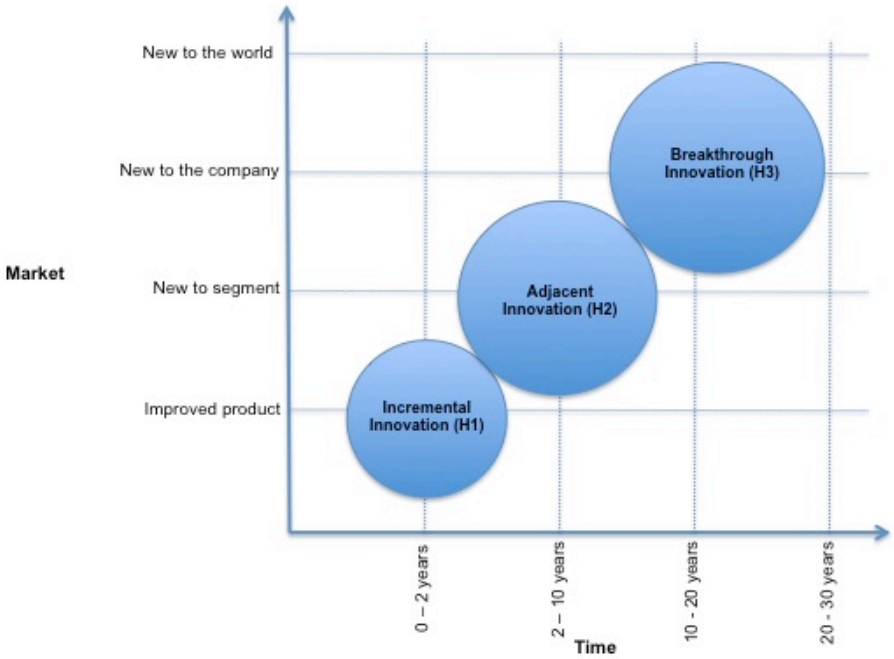
4/4 matrix used at Philips Design.

4/4 Matrix as defined by Philips Design where x –axis is innovation type and y-axis is product life cycle. This 4/4 matrix is primarily used internally to analyze where new ideas could be placed and what product life cycle it could belong to in relation to time.

When compared with the matrix as used by other companies we see that x-axis is changed to time and y – axis is changed to Market. This change arises due to the fact that the matrix is used in the external environment. This diagram analyses where will the products land in the external market when it is generated by the innovation cycles and what time line the product must be launched at?

The research has proven that innovation happens in relation to time hence, decline is relative to 0-2 years of time, mature market is relative to 2-10 years of time, growth is relative to 10-20 years of time and emerging growth is relative to 20-30 years of growth. And where market is concerned where internally to Philips Design the importance is on the product life cycle, in

external scenario markets play an important role in defining the lifecycle of the product.



Matrix used by other organisations.

APPENDIX 19: Competency Requirement For Each Innovation Type.

The model defines the three important innovation stages in organisations innovation strategy. On x-axis it has the innovation type and the y-axis has product lifecycle (Gardien, 2008a). The three circles represent the three innovation types. H1 also called incremental innovation includes all product improvements that happen for current markets. These innovations deal with technological advancements (Christiaansen, 2008). For example, increasing the number of razor blades in a razor, or changing the material for a smoother shave etc (Christiaansen, 2008). Incremental innovation needs to happen at a quicker time cycle and individuals working at this level are specialized in skills that enable fast and effective product revisions. These individuals are concerned with protecting the core business of the organisation bringing in almost 65% of revenues from product sales.

The second circle is the H2 used for 'adjacent innovations' that is mature in nature and develops products new to the segment or the company, hence leading to a number of spin offs and collaborations with 3rd party (Christiaansen, 2008a). Individuals involved in this innovation type need to have good business knowledge and the ability to 'connect' scenarios to develop ideas that can be translated into a product and put into the market through inside- out innovation strategy (Christiaansen, 2008a). It provides opportunity for open innovation and developing networks. Individuals working in this scenario have varied life cycle and their input depends on the idea generation and effectiveness of the creative/design capabilities and opportunities provided by the organisation to explore its assets and exploit its networks.

The third circle is the H3 involved in 'breakthrough innovation'. The concept of Design Driven Innovation by Roberto Verganti can be perfectly implemented in this innovation strategy. This circle involves in exploring socio economic scenarios, provoking the consumer to receive insights and exploring multiple scenario and connecting them to make proposals that are new to the world and are a source of emerging growth (Christiaansen, 2008). In reality ideas that are generated in this circle do not make as products but could trickle down as viable options for further exploration at the adjacent

innovation circle H2 (Gardien, 2008b, Christiaansen, 2008). The individuals involved at this level of innovation are 'explorative' and they need good communication channel between the R&D departments to align their thinking with technological innovations in the organisation (Gardien, 2008a). They need full rights to exploit assets of the organisation and should be allocated enough budgets.

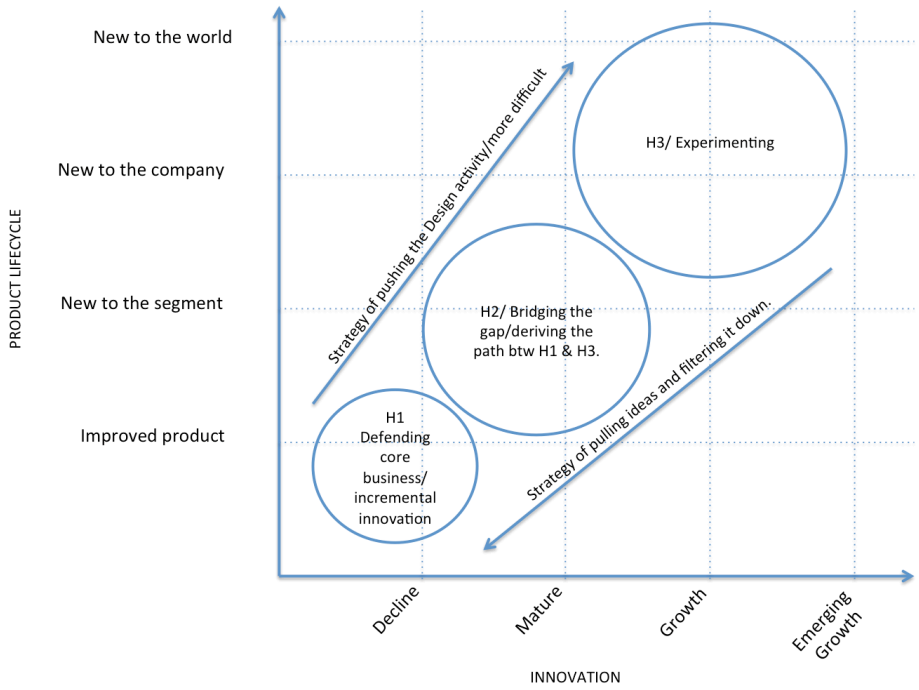
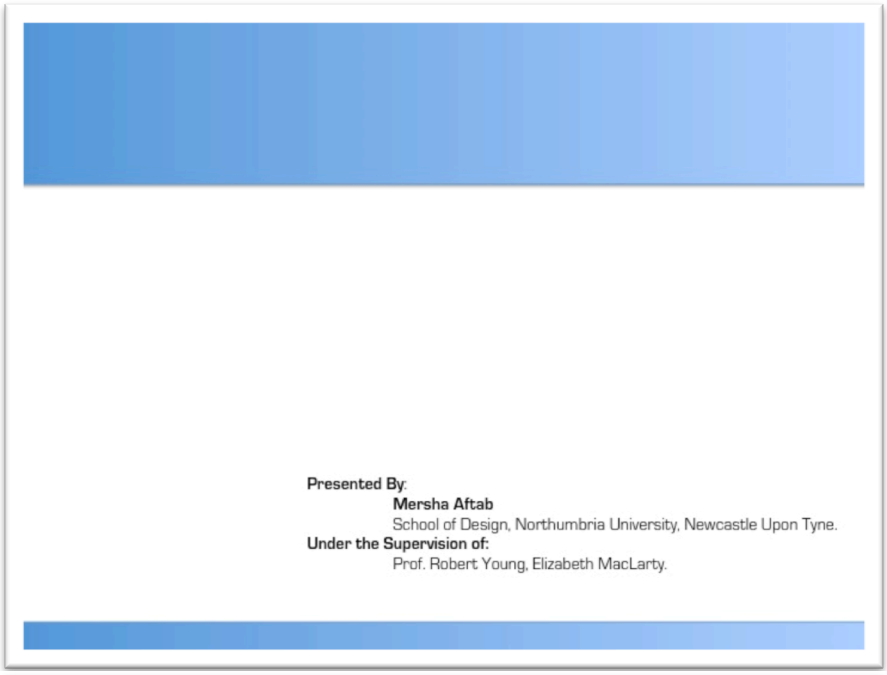
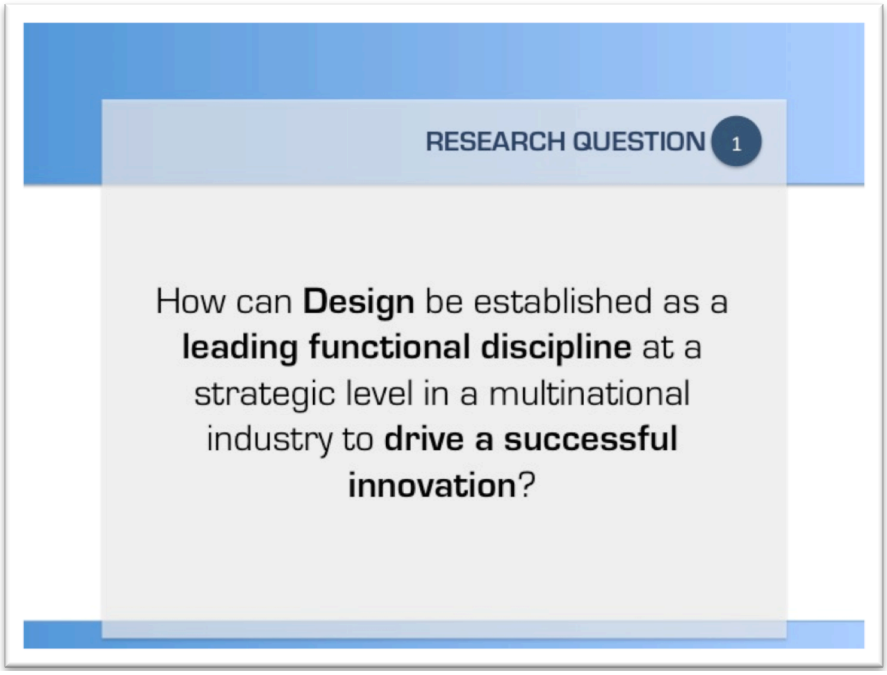


Figure 10.14: 4/4-matrix (evolved from Philips Design, IBM and Company B). (Gardien, 2008b)

In practice design should have participation in all the three circles; H1 - incremental innovation, H2 - adjacent innovation, and H3 – breakthrough innovation. To enable successful participation and maximum exploitation of design skills, there is a need to align all the innovation types with the strategic development plan of the company (Mintzberg, 1987).

APPENDIX 20 – Presentation Given at Philips Design.

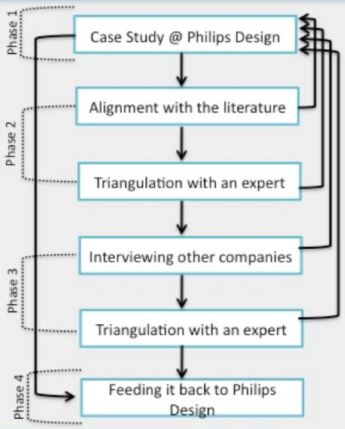




HYPOTHESIS 2

Design can be established as a **leading functional discipline** at a strategic level in a multinational industry to **drive a successful innovation** if it **engages** all its competencies of **'Creativity', 'making connection'** and **'exploration'** and enables **strong ideas** to be **debated** and become valuable business propositions of the future supported by an **explicitly defined process.**

METHOD 3



EXPLORATION 4

Daimler, Airbus, Nokia, Ericsson, Danisco, Xerox, IBM, Novo Nordisk A/S, Arla foods, Presalit, Strategos.

Daimler

Design is involved in consumer research since the beginning. Their consumer research process matches with Philips Design Scoping framework.
Very innovative ways of leading an idea to success.

Airbus

Design has a minimal role and is complete contrast to Philips.

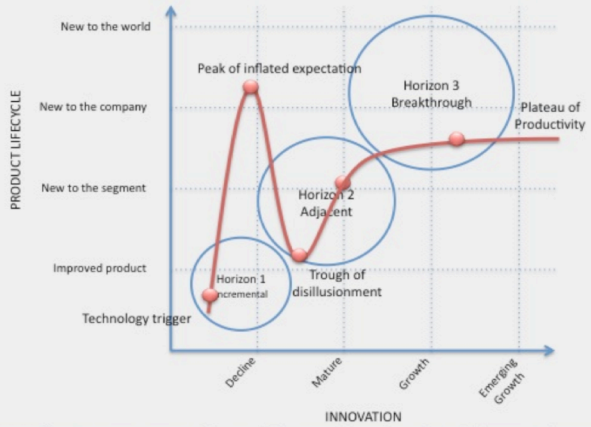
Balances two different cycles of Innovation within the strategy successfully.

Nokia

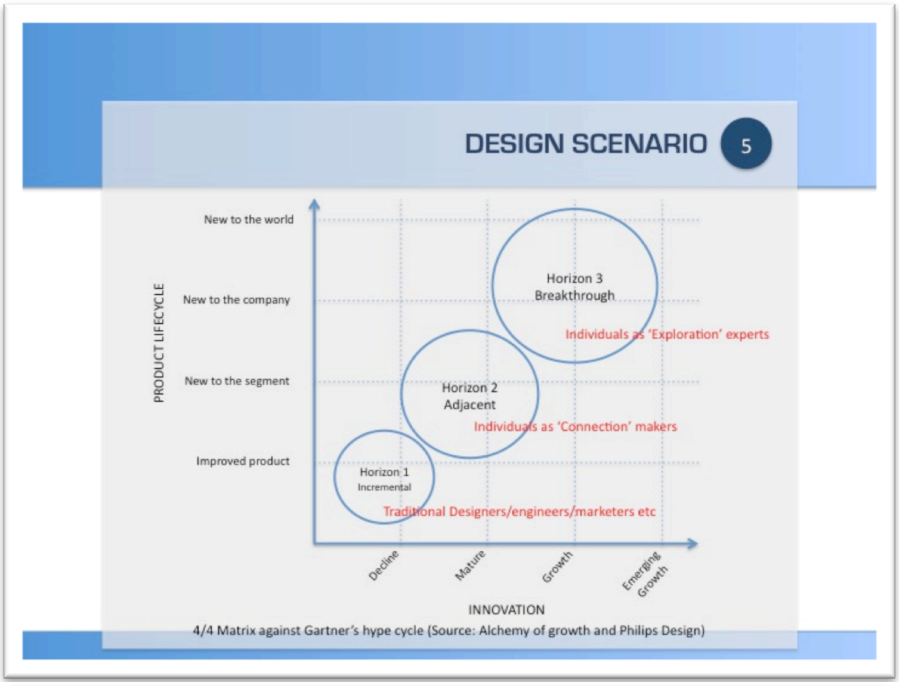
Design work culture is very close to Philips.

Their Design process has not been successful and has gone through a lot of changes.

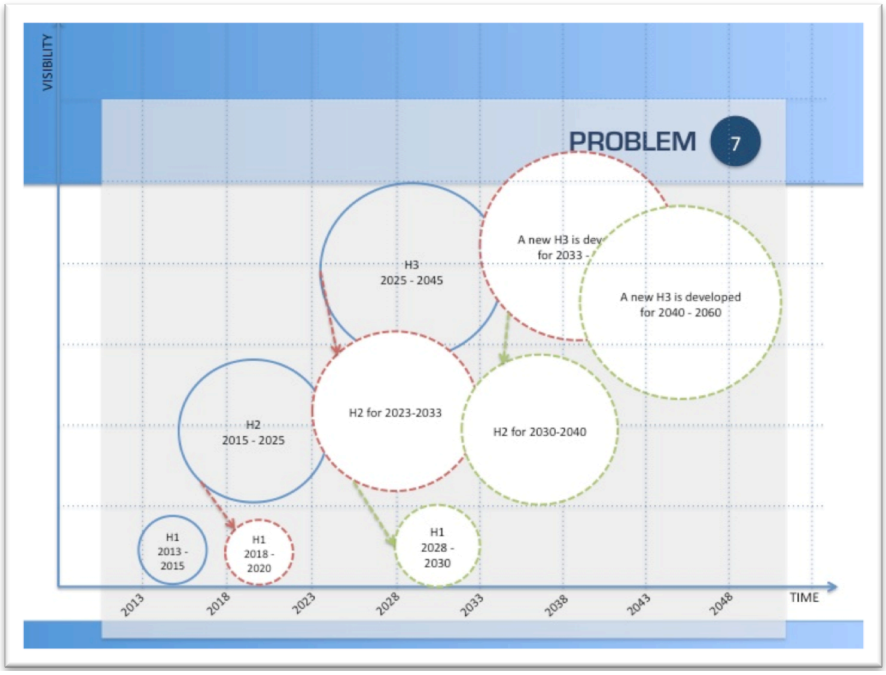
INNOVATION SCENARIO 5



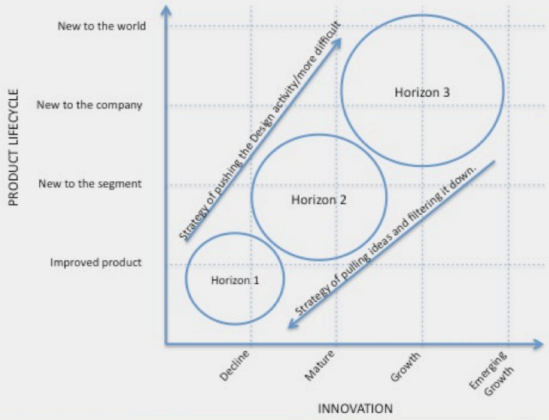
4/4 Matrix against Gartner's hype cycle (Source: Alchemy of growth and Philips Design)



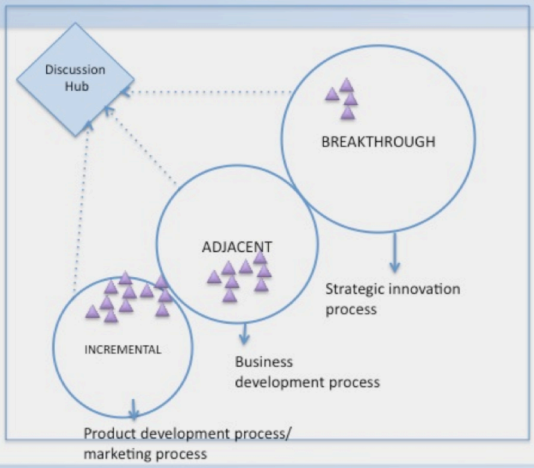
4/4 Matrix against Gartner's hype cycle (Source: Alchemy of growth and Philips Design)



CROSS INDUSTRIAL DIFFICULTIES 8



CROSS INDUSTRIAL DIFFICULTIES 9

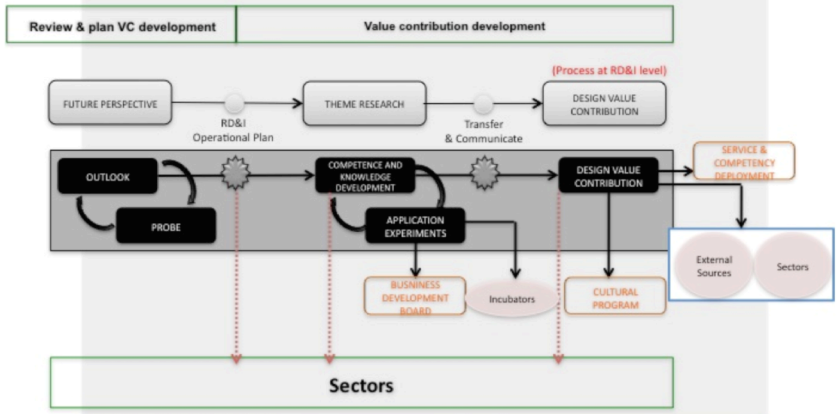


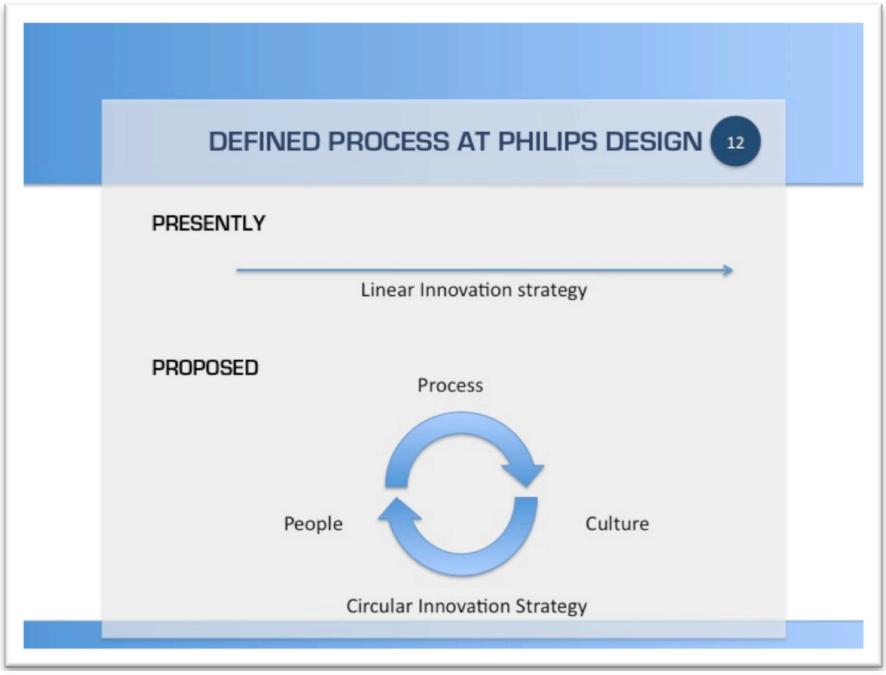
CONCLUSION 10

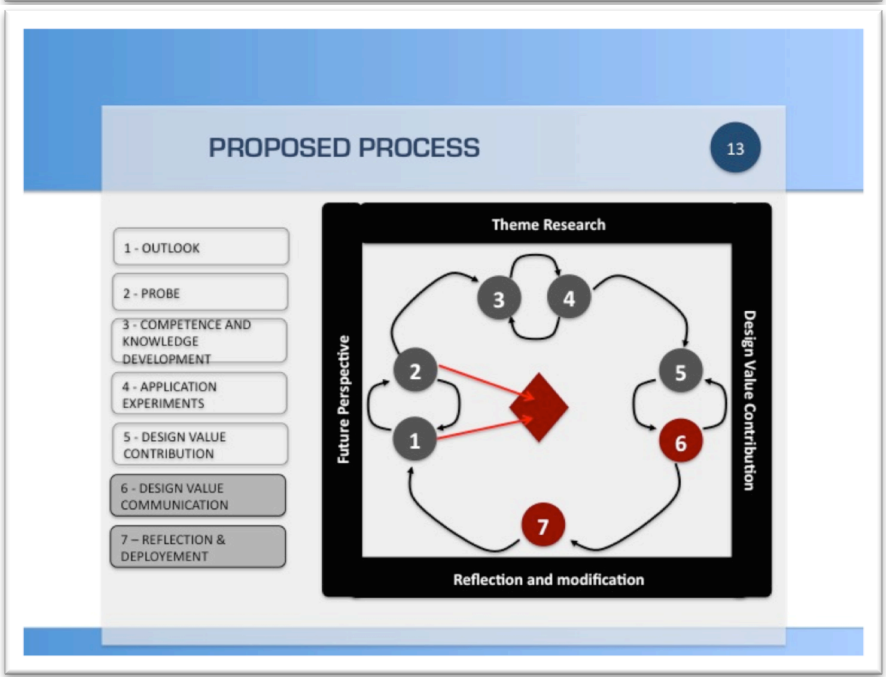
FUNCTIONAL LEADERSHIP In a multinational industry.

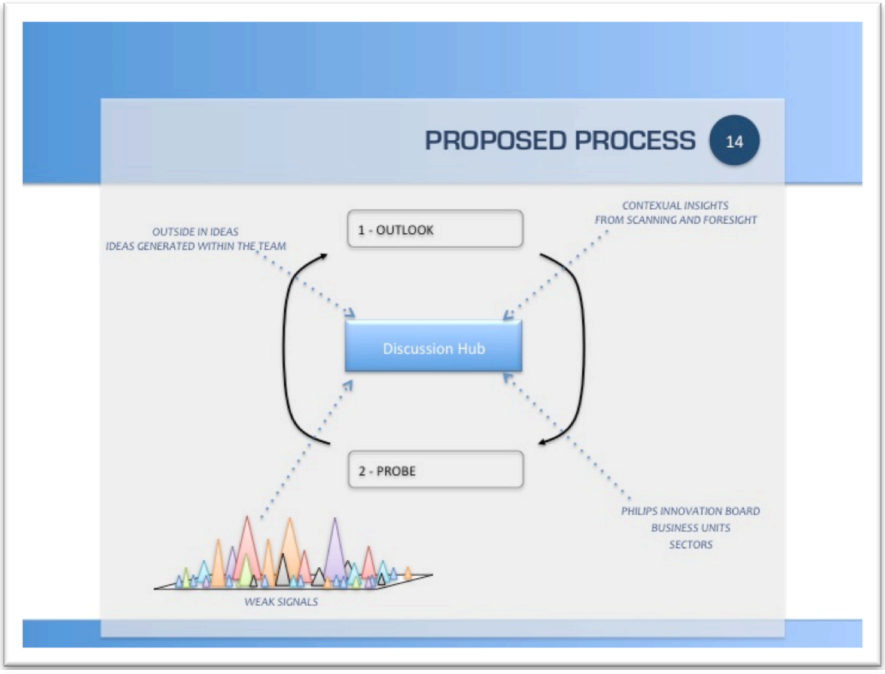
- An explicitly defined innovation process with well defined communication channels.
- Incorporation of Designers and non-Designers into the roles of Design as 'creators', 'connectors', 'explorers'.
- Design directly relates to brand equity.
- Competency development across all horizons of growth and the role of the leader to incorporate competency identification.

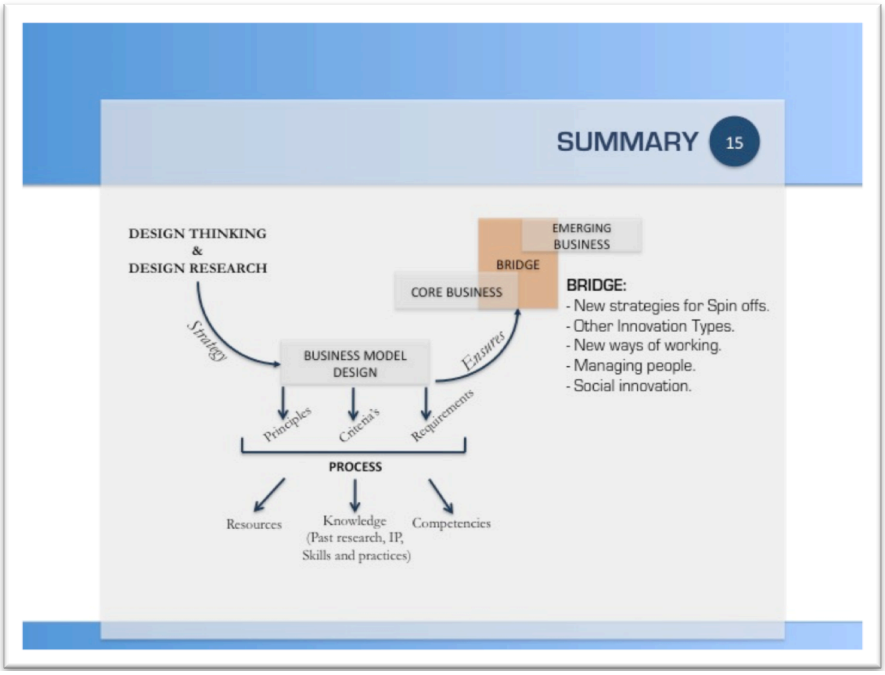
DEFINED PROCESS AT PHILIPS DESIGN 11




DEFINED PROCESS AT PHILIPS DESIGN
12
PRESENTLY
Linear Innovation strategy
PROPOSED
Process
People
Culture
Circular Innovation Strategy


PROPOSED PROCESS
13
1 - OUTLOOK
2 - PROBE
3 - COMPETENCE AND KNOWLEDGE DEVELOPMENT
4 - APPLICATION EXPERIMENTS
5 - DESIGN VALUE CONTRIBUTION
6 - DESIGN VALUE COMMUNICATION
7 – REFLECTION & DEPLOYEMENT
Theme Research
Future Perspective
Design Value Contribution
Reflection and modification


PROPOSED PROCESS
14
OUTSIDE IN IDEAS
IDEAS GENERATED WITHIN THE TEAM
1 - OUTLOOK
CONTEXUAL INSIGHTS
FROM SCANNING AND FORESIGHT
Discussion Hub
2 - PROBE
PHILIPS INNOVATION BOARD
BUSINESS UNITS
SECTORS
WEAK SIGNALS


SUMMARY
15
DESIGN THINKING
&
DESIGN RESEARCH
Strategy
BUSINESS MODEL
DESIGN
Ensures
EMERGING
BUSINESS
BRIDGE
CORE BUSINESS
BRIDGE:
- New strategies for Spin offs.
- Other Innovation Types.
- New ways of working.
- Managing people.
- Social innovation.
Principles
Criteria's
Requirements
PROCESS
Resources
Knowledge
(Past research, IP,
Skills and practices)
Competencies

APPENDIX 21 – Explanation for the construction of the comparative graphs.

Construction of the Graph for Comparison 1: Change In Individual Expectation Within The Innovation Cycles

This comparison takes place between two theories. The first is highlighted with the graph of the 4/4-matrix as seen in figure 9.4 with the x-axis as time and the y-axis as the market with the three innovation cycles.

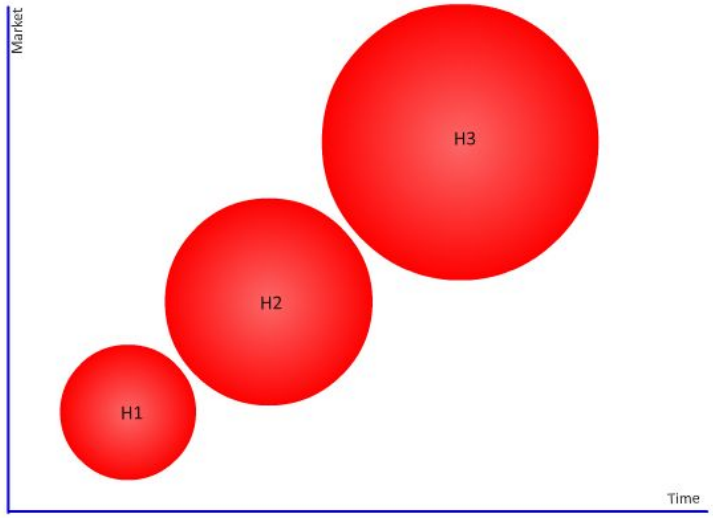


Figure 9.4: 4/4 Matrix with x-axis as time and y-axis as market.

And the second is highlighted through the graph of Gartner's Hype Cycle with the x-axis as time and the y-axis as expectation (Figure 9.5).

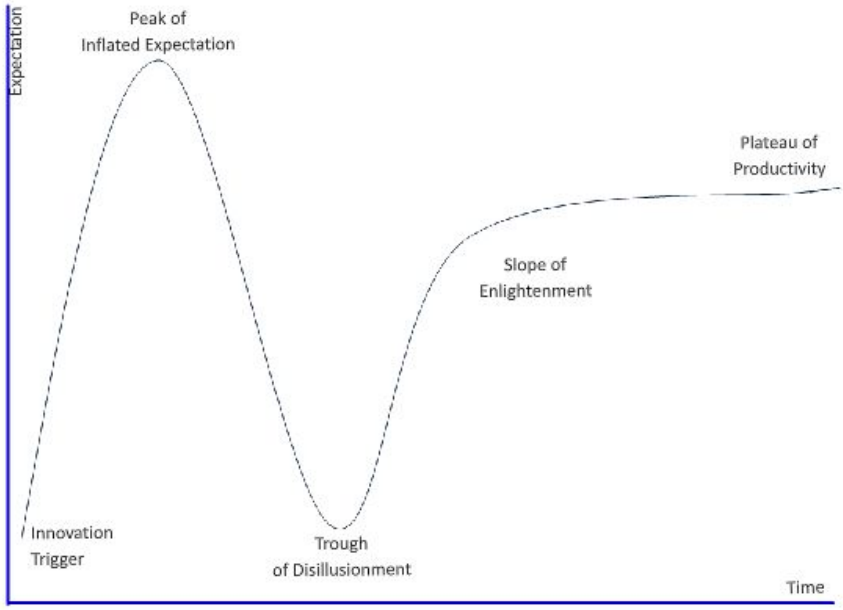


Figure 9.5: Gartner's Hype Cycle with the x-axis as time and the y-axis as expectation.

For comparison, the two graphs are joined to form a three-dimensional graph with time as the x-axis, expectation as the y-axis and the market as the z-axis (Figure 9.6).

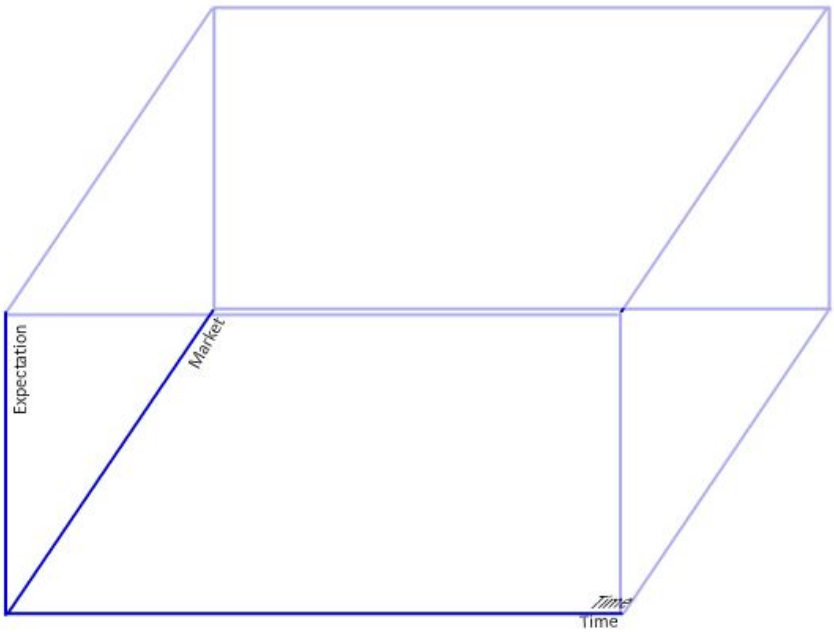


Figure 9.6: Three-dimensional graph for comparison 1.

For a better explanation of these figures, Figure 9.7 shows the innovation cycles and the Gartner's Hype Cycle as a build of three-dimensional graph. The figures

are based on the presumption that innovation cycle H1 is the source of all innovation triggers; H2 is responsible for the trough of disillusionment and H3 pushes the innovation into the 'plateau of productivity'.

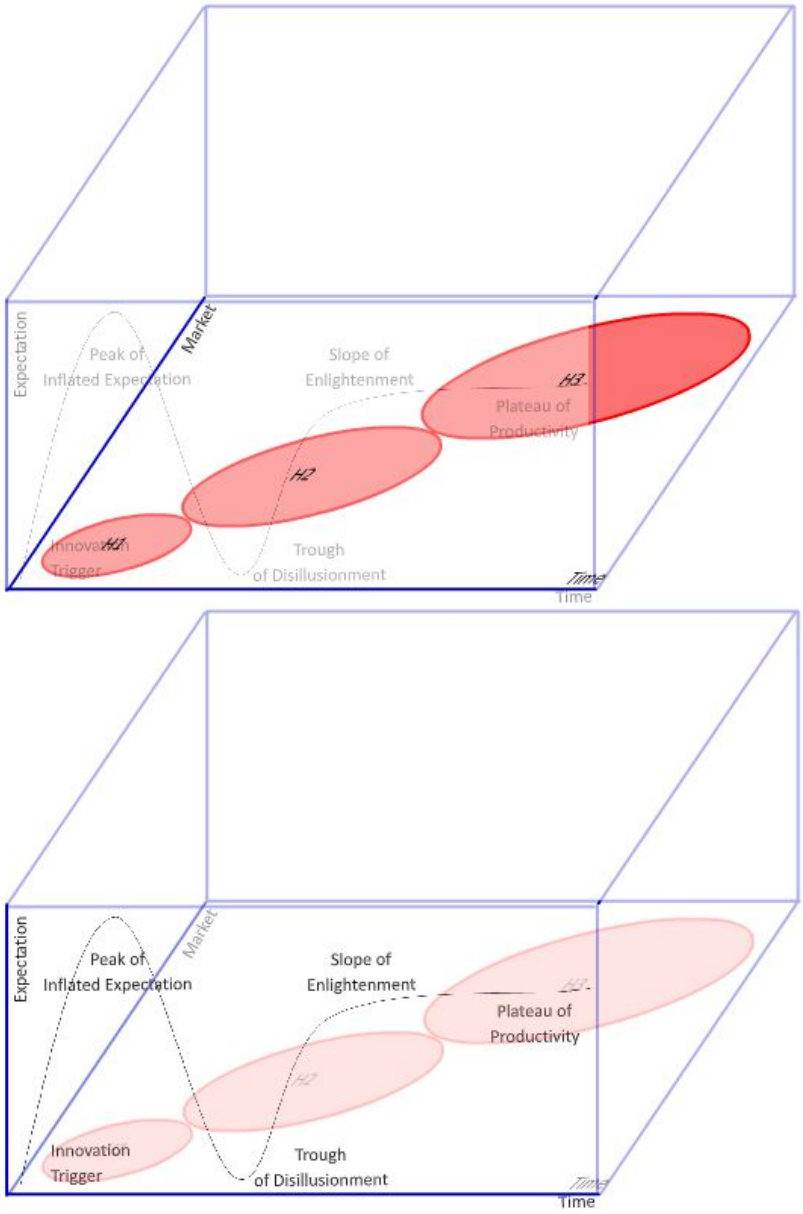


Figure 9.7: Three-dimensional graph depicting the Gartner's Hype Cycle and the three Innovation cycles.

But the research goes on to explain that in practice it is not that straightforward.

Construction of the Graphs in Comparison 2: The Corporate Culture Change

The comparison to show internal cultural change is done using two graphs. The first is the 4/4-matrix with time as the x-axis and market as the y-axis (Figure 9.11).

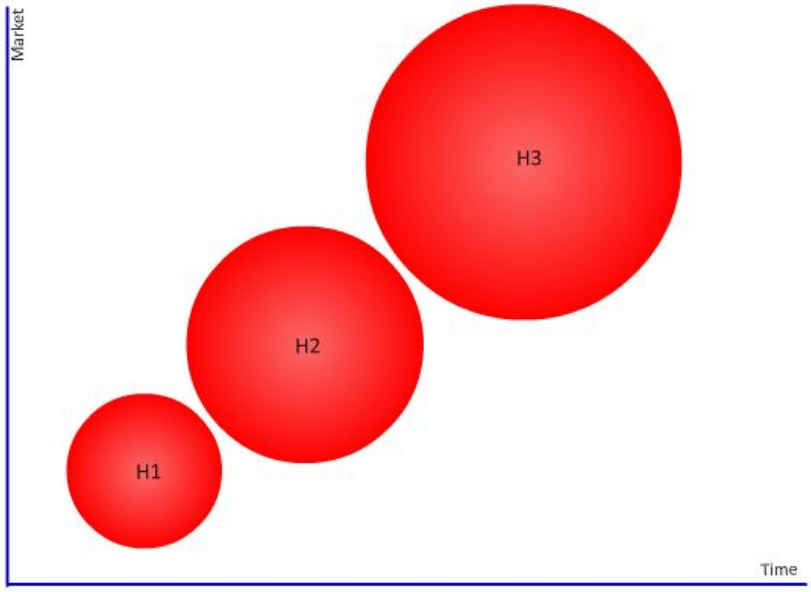


Figure 9.11: 4/4 Matrix with x-axis as time and y-axis as market.

The second is the change cycle with the x-axis as time and the z-axis as performance (Figure 9.12). The curve depicts the cycle of change of an individual experiencing a changed situation. These individuals go through four cycles of changes; initial shock which reduces their performance; denial, which further affects their performance; anger when they try to fight the system; depression when they give up; acceptance when the individual realises that change is inevitable and finally integration where the performance starts to climb again.

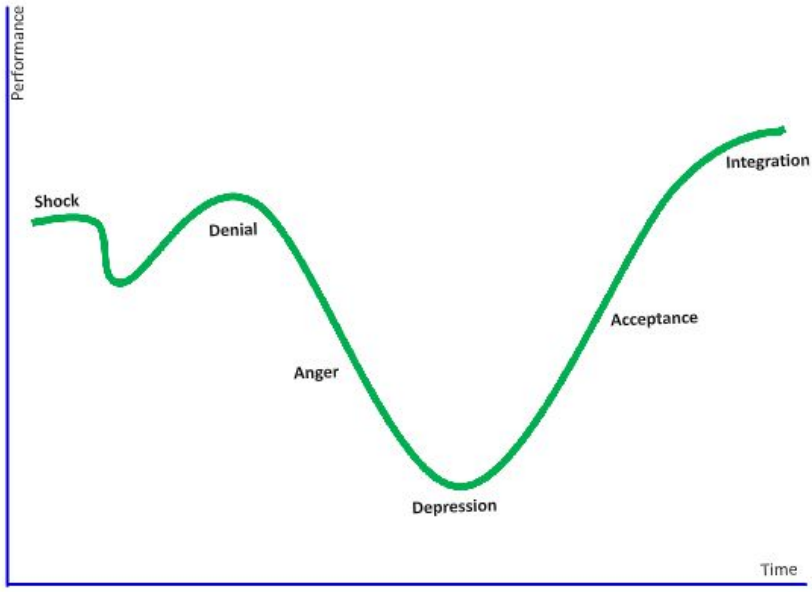


Figure 9.12: The change curve with time as x-axis and performance as y-axis.

Figures 9.13 superimposes the two graphs to show the relationship between changing innovation cycles/horizons and the change curve. The graphs expresses the changes the individuals go through while coping with the changes caused due to change in time, market and expectation (shown in section 9.3.1).

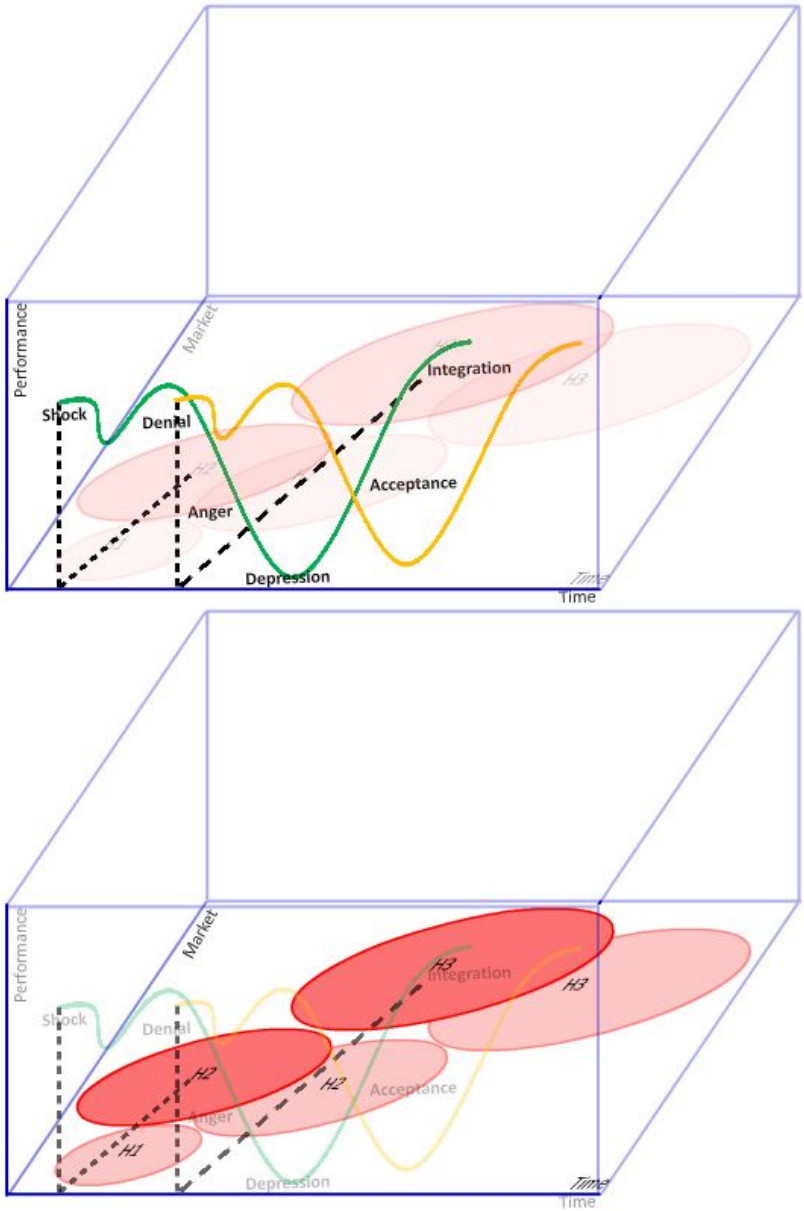


Figure 9.13: Axonometric graph depicting the Change Curve and the three Innovation cycles.

Construction of the Graphs in Comparison 3: Effect of Corporate Changes on Adaptability Within Teams

The comparison uses two graphs to show how fast the teams within the three innovation cycles/horizons adapt to the changes. The first graph used is the 4/4-matrix with time as the x-axis and market as the y-axis (Figure 9.15).

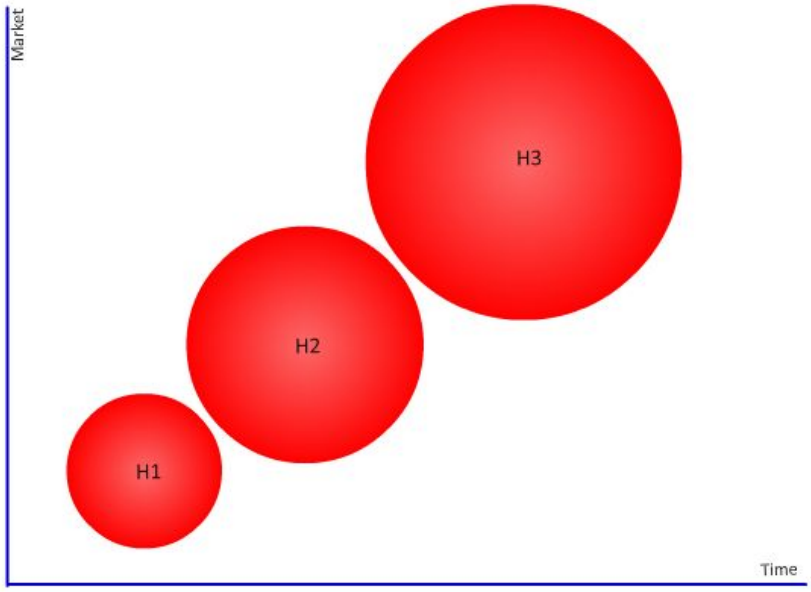


Figure 9.15: 4/4-matrix with time as the x-axis and market as the y-axis.

The second graph used is the diffusion curve that explains how, why, and at what rate new ideas and technology will spread through the internal cultures of an organisation. The diffusion curve has time as the x-axis and the number of people as the y-axis (Figure 9.16).

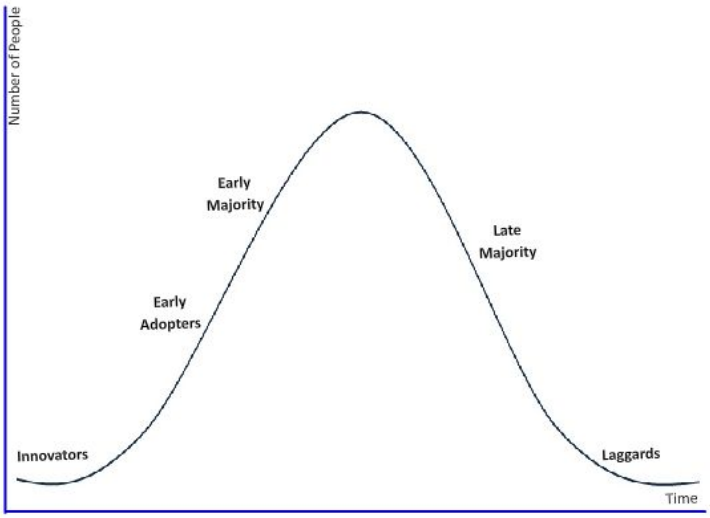


Figure 9.16: Innovation diffusion curve.

For a better explanation, figures 9.17 show the 4/4-matrix and the diffusion curve in a three-dimensional graph.

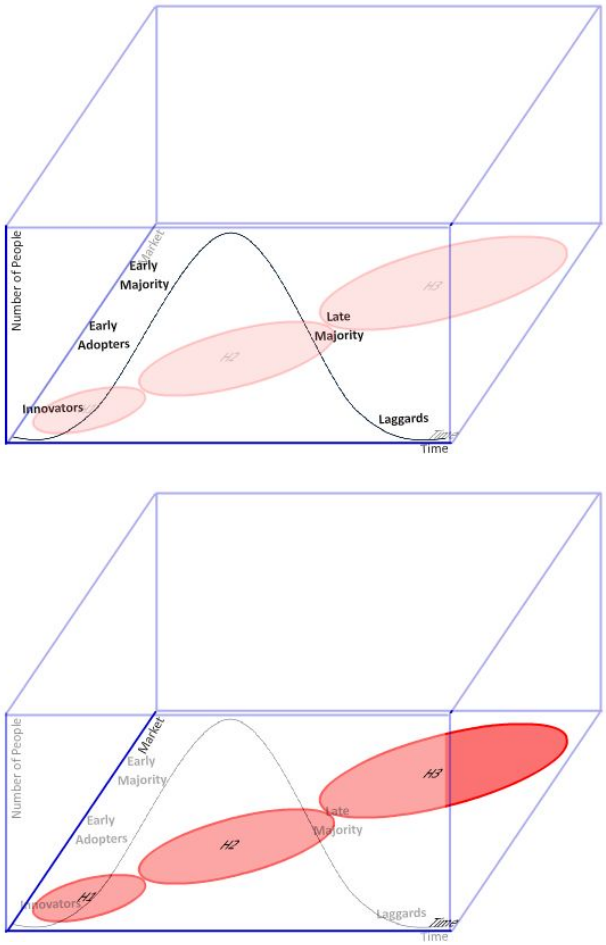


Figure 9.17: Three-dimensional graph showing relation between the diffusion curve and 4/4-matrix.

APPENDIX 22 – Papers Presented at Conference

FUNCTIONAL LEADERSHIP OF DESIGN

"Development of effective techniques to drive innovation and establish design as a leading functional discipline at a strategic level in a multinational organisation."

(2009 – 2012)

Research document for the Doctoral Proposal Conference, Denmark

March 2011

Author: Ms. Mersha Aftab

Co-Author: Professor Robert Young

Co-Author: Professor Elizabeth McLarty

School of Design,

Northumbria University,

City Campus East,

Newcastle upon Tyne,

NE1 8ST.

ABSTRACT:

This research investigates the development of effective techniques to drive innovation and establish design as a leading functional discipline at a strategic level in a multinational organisation. It goes about this by making a detailed case study of the innovation process and practices within Philips Design based in Eindhoven, The Netherlands. With design as a key decision making function within the company, Philips Design wants to use design research to build an integrated map of its actual practices and get valuable insights on the best innovation practices and challenges to run a successful innovation process for their business.

The scope of this research was outlined by the Case study methodology, which was part of an empirical enquiry, where the researcher became a 'participatory observer' in Philips Design, conducting one-on-one interviews and using a Delphi Technique for data collection. The collected data was represented in logical manner using visual mapping techniques. Further, triangulation and semi-structured interviews will now be used to validate the data.

To date, the research has concluded that there is a requirement to define 'perspectives' from a design point of view to map an innovation process. The mapping helps to find effective techniques that would be useful to bridge the gap that exists between, the thinkers who try to define new competencies for the business and, practitioners who work to defend the core business. It also confirms that design can play a strategic role in driving innovation in a company. The correlation of the research with literature in the field has led to it being based on the theory of innovation by Roberto Verganti (2009). The contribution to knowledge of the research is to help organisations map their innovation process with a design perspective and analyse the best approach to be taken for design to be established as a functional leading discipline in their organisation. The research makes a tangible link between innovation theory as proposed by Verganti and practice through case study research. The research also highlights certain challenges in carrying out an effective innovation process to inform practitioners.

1. Introduction:

1.a Purpose of this document

This document describes in detail the current PhD research programmeme at Northumbria University's Centre of Design Research for the purpose of doctoral conference in Southern Denmark University, Billund. It affirms the research progress since its nascent stages to present date, giving an insight on the findings at each phase in the research programme. The paper also includes future developments for the remaining period of time.

1.b Overview

This is a case study based research carried out by being a participatory observer in Philips design studios based in Eindhoven, The Netherlands. The research bases itself on the philosophies of 'Design Driven Innovation' (Verganti, 2009). Roberto Verganti explains that firms aiming for creating radical ideas use Design driven innovation. [These firms] take a broader perspective by investigating the evolution of culture, society and technologies, and make proposals putting forward a vision about possible new product meanings that people [are] not solicited but that they were eventually just waiting for (Verganti, 2009). This theory requires design to be one of the functional leading disciplines of the company and perform under certain circumstances. It also requires employees to know the challenges in pursuing design driven innovation and how to curb the problems.

The research started with a 9 months internship at Philips Design, a company that bases its innovation process on the understanding and tracking of present paradigm shift to make future theme decisions. The roles and actions for the process were not defined and communication took place very implicitly and on an adhoc basis. The company had identified the need for an explicit review to map the way innovation is being carried out presently, keeping in mind past evolutions and landmarks, communication channels and specific roles and ownership of the steps within it. Therefore, this research is based on a mutual appreciation between Philips and the researcher of the value of developing a case study of the Philips Design

innovation process, with the aim of mapping the process thought to be operating from the organisational process perspective and from the practitioner's perspective.

The research tries to test the theory of 'design driven innovation' as a case study done at Philips Design. The empirical evidence confirms a gap that exists between the thinkers trying to define new competencies for business and practitioners who try to defend their core business. The existence of the gap is not only a problem limited to Philips but to other businesses as well. The research also identifies a need to define design perspectives that would help companies define a successful innovation process to put design as a functional leader and establish design driven innovation for breakthrough at the core of any companies strategy. Perspectives that would identify the basic innovation approach of the corporations and would act as a scaffolding to help innovators develop viable options for the business.

The research goes on to address the topic on an action research methodology, which is divided into 4 broad phases. Each phase has its set of aims and objectives. Each of them involves a complex combination of methodologies for data collection.

Phase one; the **case study phase** using case study methodology (Denzin, 1978) involved the researcher being stationed at Philips design[1] studio in Eindhoven to collect primary data for the research. It involved her in making implicit information explicit and mapping the innovation process being followed in Philips Design at the corporate level. This research involved Delphi technique (Sackman, H., 1974), one on one interviews and participatory observation to collect data, which formed the background of the research. 'Visual mapping' of data was done to arrange collected information in a logical way and present it to the stakeholders[2]. The 'mapping' methodology was an effective way of data visualisation and later for knowledge communication. For validation, triangulation methodology was used (Altrichter et al., 2008) to compare, refine and validate the internal literature collected.

Apart from refining/defining the innovation process the outcomes raised important questions, which if answered were the key to execution of effective innovation.

The second phase, the **knowledge satiation** the researcher reviewed general literature (Denzin, 1978) about different innovation paradigms being used in the organisation, in contrast to the one being used in Philips design. The literature was gathered through a lot of different sources.

Primarily comprising of Internet, library, company releases, conference papers and Journals. This phase involved triangulating the literature gathered, with the findings from phase one with a 3rd party expert who has the knowledge of the innovation process at Philips design and also has the wider knowledge of the design driven innovation.

The third phase, the **critical analysis** involves one to one interviews with 3 selected companies to identify similar or different characteristics in their innovation process. These three companies were selected based on the following key criteria:

a) Corporations serving diverse categories with a creative portfolio management team.
b) Corporations where design has a functional leading discipline role.
c) Corporations, which follow an innovation approach independently applicable to the organisation. Essentially in contrast to Philips Design's innovation policy.

The results from the interview of selected companies will be triangulated against the results of the triangulation process done with the process of Philips design, along with the 3rd party expert to identify similarities, differences and characteristics of design driven innovation.

The 4th phase, **review** involves the researcher going back to Philips Design for a review of the findings from the interviews of the 3 companies. This phase marks the verification of the conclusions and will enable the final compilation of the research.

This stage will conclude the main problems faced by multinational communities, and methods used by them to solve these challenges to enable running of a healthy innovation process. It will also emphasize the importance of mapping an innovation process and converting tacit knowledge into explicit knowledge, highlighting the importance of motivated individuals, and the strategic role of design. Last but not least it will characterise how design can perform well as a functional leading discipline in a company.

The next chapters will introduce the reader to the methodologies being used and conclusions rendered during each of these phases in detail.

1.c Aim and Objectives:

The **Aim for the present PhD topic is**:

- ✓ Development of effective techniques to drive innovation and establish design as a leading functional discipline at a strategic level in a multinational organisation.

The **objectives of the research topic are**:

- ✓Review of existing literature that describes innovation approaches, theory and case studies of best practice, within multinational organisation corporations.
- ✓Mapping of design driven innovation process being followed by Philips Design at a corporate level.
- ✓Articulating challenges in practicing effective innovation.
- ✓Developing a perspective to stimulate a design driven innovation process in a corporation.
- ✓Articulating techniques to execute effective design driven innovation in a corporation.
- ✓Defining platforms to run the innovation process to ensure maximum business motivation and growth.

2. Defining of the problem area

The findings gave rise to uncertainties in the system, which were then defined with support of the literature. The challenge was to find supporting literature for innovation and innovation mapping with a design perspective. The literature gathered during the case study in Philips Design formed the base for the research.

The problem area was defined by exploring four dominant themes of the research;
a) Evolution of innovation, its types and meaning,
b) The 'Individual' and organisation,
c) 'Design' and the organisation, and
d) 'Mapping' and innovation.
Along with the above, the ground work for data collection was done during the 9 months internship at Philips Design, which included an internal literature review in the form of power point presentations, papers, charts, and other internally published work etc.

2.a Evolution of innovation and meaning

Innovation is not a rigid process but an approach taken by individuals in their daily life. Innovation can be defined as "a personal approach taken by an individual to achieve their personal goals and interests."

> As said by *Scott Bercun, "Innovation begins with bright minds following their personal interests. Other innovations are driven for the quest for cash. Waves of innovations have come from individuals in need of something they couldn't find." (Scott Bercun, 2010)*

It defines the directional path taken to achieve a goal; it represents the dots that connect the present to the future, highlighting solutions taken to achieve the desired goals. These goals could be personal, corporate or social (Nussbaum, 2008).

Innovation has a particular meaning when it is used in a multinational organisation's corporate environment. Each corporation has an innovation approach, which usually is a very complex process. Innovation has a

number of parameters and one innovation archetype cannot fit into all models (Jeffery Phillips, 2010; John Seely Brown, 1997).

Thus, there is a requirement for constant change within a business. Moreover, the constant rift between what needs to be done to secure the future and what is being done in the present scenario gives innovation a fluid identity.

> *As said by Scoones, Adwera, "Everyone agrees that science, technology and innovation must be at the centre of economic growth, livelihood improvement and development more broadly. But it must always be asked: what innovation - and for whom? Decisions about direction, diversity and distribution are Key in any discussion of innovation options and wider development pathways." (Scoones, I. and Adwera, A., 2009).*

Innovation has its evolutionary characteristics since its inception. Innovation shows the incremental changes towards significant change. Hence, evolution owes its existence to erratic innovations, which causes 'social changes' also called 'social innovation' (Khanafiah and Situngkir, 2009).

2.b. The individual and the organisation

All organisations are made up of individuals. And every individual has specific behavioral pattern. These behavioural patterns make the difference in his/her thinking, actions, understanding and decisions throughout his/her life (Schein, 1985).

Empirical evidence during the case study suggest that individual behaviour affects organisational culture and is an important factor [to] the success or failure of [an innovation system] in [an organisation] (Peters & Waterman, 1982). On the contrary scholars like Hoftstede believe that big organisations could train and alter human behaviour to maintain a healthy culture (Hofstede et al., 2010).

The present research supports the former school of thought and believes that individual behaviour can influence organisational culture and its work radically.

> *According to Mike Berrell, Phil Wright and Tran Thi Van Hoa," Traditional explanations of management behavior have included understandings about the influence of values, norms, roles, regulations and activity within organisations". (Mike Berrell, Phil Wright and Tran Thi Van Hoa, 1999)*

The individual behavioural patterns lead to the formation of cultures in a group or an organisation. *(Schein, 1985)*

Organisational cultures are influenced greatly by top-down change in models. Organisational cultures are created at every level and are greatly influenced by leaders. *(Schein, 1985).*

> *Organisational cultures are created by leaders, and one of the most decisive functions of leadership may well be the creation, the management, and–if and when that may become necessary–the destruction of culture...there is a possibility...that the only thing of real importance that leaders do is to create and manage culture. (Schein, 1985)*

Ancient studies show us that values, norms, roles influence the organisational work environment. Values guide and influence behavior and thinking and give a sense of direction focus. They alter priority for individuals, groups and organisations.

> *According to Michael Henderson & Dougal Thomps, " most people have a combination of three types of values following in distinct categories known as Control values, Ethical values and Developmental values." (Michael Henderson & Dougal Thomps, 2003)*

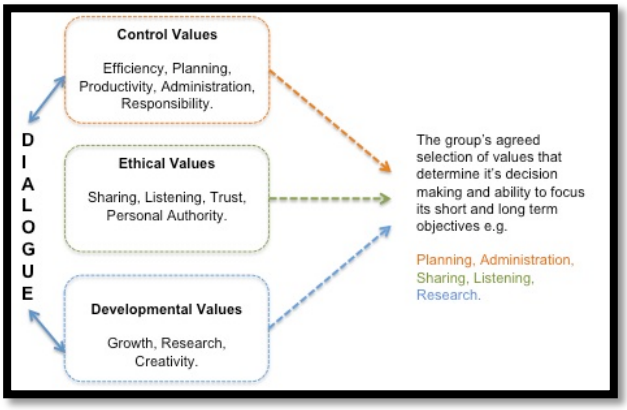


Figure 1: influence of value in work place (Michael Henderson & Dougal Thomps, 2003)

Design poses new cultural challenges to an organisation as well. Designers add a new dynamic to the organisation by bringing in its new way of thinking, reasoning and probing into new dimensions. Empirical evidence shows that designers and design thinkers don't like to follow rules, they like working on their own.

Hence, there is a need to integrate the interdependent nature of the departments as choices made by departments and groups can affect the organisation in a drastic way. Nevertheless, a strong leadership is essential to cultivate a corporate culture of innovation and strategic creativity. (Hartmut Esslinger, 2009).

Thus, we can say that innovation process is greatly influenced by individual values, beliefs, and motivation and to drive a successful innovation process the organisation needs individuals who are self-motivated and can contribute to its culture.

2.c Design and the organisation

Design influences decision making in many different ways. The nature and scope of design has undergone immense transformation and is still changing radically. From being the owners of product aesthetics and transforming to design for customer experience, designers have moved away from the aesthetic configuration.

> *Sharon Poggenpohl & Keiichi Sato state, "Here another kind of process unfolds, one initially divorced from physical making and more deeply engaged with processing information and understanding context through the generation of frameworks or conceptual diagrams, defining the problem to be addressed, asking questions, accessing research, constructing new research, and entertaining possibilities." (Sharon Poggenpohl & Keiichi Sato, 2009)*

This new concept of design requires disciplinary resources, something much more than style magazines and trends, and it moves beneath the superficial to the core of design-driven development (Verganti, 2009). The design-driven development demands ideas about design processes and methods, research data and its analysis, knowledge of the past for the purpose of building something appropriate to the present or future. *(Donald Schon, 1983)*

> *While design's newer contribution shifts to earlier stages, it is at such stages where the practice of design exhibits the most "complexity, uncertainty, instability, uniqueness and value conflict." (Donald Schon, 1983)*

Design driven strategy focuses on making the product as well as the process of design more experiential and consumer focused *(Donald Schon, 1983).* It results in human adaptive solutions. More environmentally responsible and sustainable design strategies are based on creativity, insight, and cultural awareness is.

> *"Strategy formed with creative inclination offers clear benefits over the traditional supply-chain –dominated approach to business." (Hartmut Esslinger, 2009*)

Empirical evidence suggests that in Philips Design, the role of design moved from a contract based group to a functional leader for the company. On arranging the data on a timeline (Figure 15), it showed a move towards creative thinking in the company's corporate strategy. Philips corporate initially being technology driven, realised the need to transform itself to

become driven by ‘experience’ (Figure 15). This lead design to change its role and become an important function within the company.

Professor Eddie Obeng classified four different areas for a company to innovate and confirmed that today the need is to concentrate on User-centered design-led innovation.

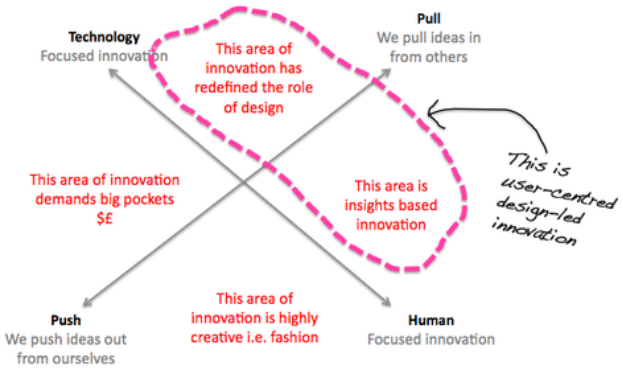


Figure 2: Types of innovation (Source: Professor Eddie Obeng, Director of Learning at the Pentacle The Virtual Business School, 2010)

Verganti, R. (2009) *Design driven innovation- changing the rules of competition by radically innovating what things mean,* Harvard, Harvard Business School Publishing corporation.

According to Professor Eddie Obeng's model today many problems can be solved through the use of integrated design. Today, products are all about 'user behaviour'. In fact, the perspective of 'Profit making' in a business and making of 'useful products' revolves around the study of user, anthropology, human behaviour and psyche. The 'User' is the priority in all decision making in most companies and design is better equipped to make 'user centered' innovative products than any other discipline.

> *"Imagine if we intentionally designed our products or our client interactions rather than simply allowed them to evolve." (Jeffery Phillips, 2010)*

In addition to that Roberto Verganti (2009), proposed an idea, which added a new dimension to drive a companies innovation policies. This research is based on that philosophy proposed by Roberto Verganti (2009) known as 'Design driven innovation'.

> *"Design driven innovation is used by firms aiming for breakthrough, where they take a broader perspective by investigating the evolution of culture, society and technologies, and make proposals putting forward a vision about possible new product meanings that people are not solicited but that they were eventually just waiting for". (Verganti, 2009).*

No matter which platform of innovation is used, design's role is critical for it to run successfully.

2.d 'Mapping' and innovation

Ikujiro Nonaka, Hirotaka Takeuchi (1997) concluded that knowledge in corporations could be split into two forms: tacit knowledge and explicit knowledge.

> *They further explain " Tacit knowledge includes, for example, skills that are just in your head or at your fingertips, skills which are not easy to express succinctly in words, "soft" skills. Explicit knowledge,*

on the other hand, is generally written, is about procedure and systems and formality, and is generally more easily communicated."(Ikujiro Nonaka, Hirotaka Takeuchi, 1997)

Most powerful dynamics occur when existing tacit knowledge is converted into new explicit knowledge, and existing explicit knowledge is converted to new tacit knowledge (Ikujiro Nonaka, Hirotaka Takeuchi, 1997).

This is more relevant with design taking new roles in an organisation. Literature agrees that designers follow the practice of learning by doing (Arrow 1962) and also learning by using (Rosenberg 1982). Throughout the existence of an organisation, and practice of 'learning by doing' and other techniques, lead to accumulation of a lot of knowledge. 'Knowledge' being the most valuable asset for the firm *(Tim Travers, 2000)*.

"A firm's competitive advantage depends more than anything on its knowledge. Or, to be slightly more specific, on what it knows – how it uses what it knows – and how fast it can know something new." (Ikujiro Nonaka, Hirotaka Takeuchi, 1997, p. ix)

Jurgen Habermans (1998; 33) has described "know-how" which is *the understanding of a competent practitioner to understand how to produce or accomplish something – a craftsperson or one with habituated skills."* All these concepts are very close in design context.

It is worth noting, that with design taking the role of a functional leading discipline a lot of knowledge at the strategic level could be tacit; i.e. in the form of skills, concepts, etc. The reason for this is because design and designers use their craftsmanship and skills on an adhoc basis unlike disciplines like accounts or business studies where they use analytical tools, and specific way of working.

Empirical evidence shows that the innovation process in Philips Design had evolved over time and there was a need to make the evolved tacit process more explicit. The company had identified the need for an explicit review to map the way innovation was being carried out. The variables to be kept in

mind while doing it were past evolutions and landmarks, communication channels and specific roles and ownership of the steps within it.

Along with explicit knowledge there is also a need for an effective communication channel within the organisation. Effective communication helps in broadcasting the explicit knowledge to the wider audience (Cushman and Cahn, 1985). It also enhances productivity and stops alienation of the worker from the goal. Some argue that communication and management is more or less synonymous (Tompkins 1977). There are many ways and forms that a communication mode can take in an organisation. But to establish an effective communication circuit one must understand current organisational communication structure and how that communication structure facilitates internal communication (Svecz, 2010).

> *According to Amanda-Makenzie Braedyn Svecz, "Becoming familiar with organisational communication structure and internal communication is the first step in understanding and developing business communication skills. Effective employee communication in the workplace doesn't just happen. It takes practice and hard work to improve internal communication but doing so will build better workplace relationships and increase career success." (Svecz, 2010)*

Large organisations, like Philips[3] have a complex network of communication channels, which are difficult to decipher. Hence, the current research helped in mapping its process, which holistically identified its communication channels and also key employees, attached to those channels of communication.

It is worth pointing out here that literature does not identify mapping of innovation process or communication channels from a design perspective. Most mapping processes have been done from a management stance. The mapping done by management perspective does not take into account organisational culture *(Schein, 1985)*, individual value and motivation (Michael Henderson & Dougal Thomps, 2003), and most importantly design as a functional leading discipline.

Design on the other hand maps the innovation process taking into account individual values, organisational culture and motivation (Figure 15). The figure shows the variables chosen to map the innovation process, and these includes the people as well as the process.

Summary:

The literature highlighted the following broad topics:

- ✓Basing the hypothesis on the theory of innovation by Roberto Verganti (2009) it can be said that innovation starts as a technological pursuit for most of the corporations. Though most of them aim to move towards a transformation paradigm.
- ✓Design can play a strategic role in driving innovation in a company and move it in the required direction.
- ✓Mapping of implicit data and making it explicit is the first step towards understanding and articulating a successful innovation approach of the organisation.
- ✓This mapping process has never been done with a design perspective; it has been the work of management and business studies.
- ✓Motivated individuals can achieve successful innovation and their behaviour, values and beliefs influence organisational culture.

3. Methodology

The methodology for the research was a consequence of a lot of changes in the thought process. The involvement of the third party (Philips Design) made the implementation of the methodologies very challenging. Most of the methodological steps were reformed to suit the current research and the onsite requirements.

One of the several effective ways of doing a social science research is to use Case study as an empirical inquiry *(Yin, 1994b).* The scope of this case study defined the outline of the research project. The outlining of the research conditions were being pre defined by the case study confirming the

fact that covering of the contextual conditions were highly pertinent to the phenomenon of study.

> *Robert K. Yin confirms this, when he states "a case study is an empirical inquiry that investigates a contemporary within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident". (Yin, 1994a)*

High quality data collection is a fundamental requirement for a research. The primary source of data collection for the case study was a combination of one on one interview, participatory observation and Delphi technique to collect primary data.

The interviews were often open ended in nature and were directed towards two predominant groups in Philips Design; **the thinkers** and **the practitioners**. The secondary source of data collection was archival records, participatory observation, and physical artefacts, which formed the backbone for the case study.

The present research uses a triangulation method to validate the outcomes of the case study. This is not merely aimed at validation but at deepening and widening the understanding and knowledge. It involved the conscious combination of qualitative methodologies as a powerful solution to strengthen a research design where the logic is based on the fact that a single method can never adequately solve the problem of rival causal factors *(Denzin 1978; Patton 1990; De Vos 1998).*

The present research takes place in 3 triangulation phases (Figure 3). And it triangulates data, theory and methodologies to give shape to the research. All stages of the methodology will be explained in detail in the next section.

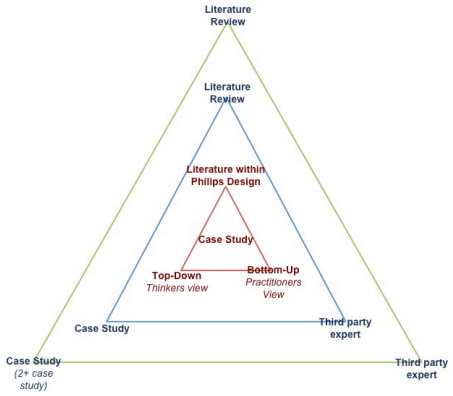


Figure 3: The Three triangulation phases in the research.

3.a Phase One: Case Study

As stated above the aim and objectives of phase one was influenced by the empirical inquiry of the case study. Being a participatory observer the privilege of taking part in certain events carved the path of a sound methodological design (Yin, 2003). Using casual data collection methods along with the formal methods and being a participatory observer helped in perceiving reality and crosschecking it with the study and interacting with the practitioners and thinkers on a one on one basis (Yin, 1994a).

The aims and objectives of the phase one methodology as represented in the IPA are given below.

Aim:

- ✓ Develop an effective mapping of complex innovation systems in multinational organisation from a design case study perspective.

Objectives:

- ✓Review of existing literature that describes innovation approaches, theory and case studies of best practice, within multinational organisation corporations.
- ✓Arranging the information on a timeline to identify its evolutionary development within the organisation over the last 10 years.
- ✓Interviewing stakeholders to generate a formal management description and map of the innovation process in Philips Design (top-down perspective).

- ✓Interviewing stakeholders to generate an informal practitioner description and map of innovation practices (bottom-up perspective).
- ✓Develop a refined generic map of the process and practice of innovation within Philips Design.
- ✓Validation of generic aspects of the map in terms of its capacity to promote reflection and understanding, ownership and refinement within Philips Design & with multinational organisations.

Though the empirical methodology for the research is 'case study', there are ontological grounds, which motivated the use of triangulation as a 2nd methodology. The objects in the research were complex; it is unlikely that any single [observer could describe them adequately]. [Therefore, there was a need for] several observers/observations in different locations and/or times, so that a more complete picture [could] be constructed (Guion, 2002).

In the present research, the validation of the data acquired during the case study is very important to be judged as "true" and "certain"(Guion, 2002). "True" in the sense of the findings accurately reflecting the real situation. "Certain" in the sense of the findings being backed by evidence.

The model in Figure 4 describes the structure of triangulation used to validate the data in Phase one. Within the triangulation methodology, a set of mixed methods was also used to carry out effective data collection and give shape to the case study (Figure 5).

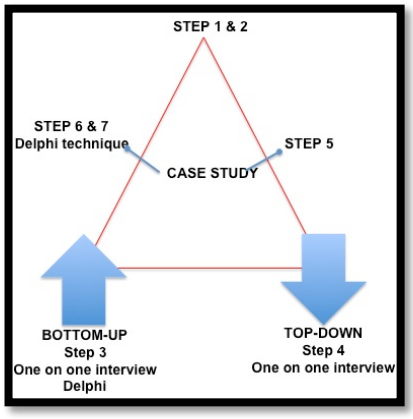


Figure 4: Triangulation method of case study methodology

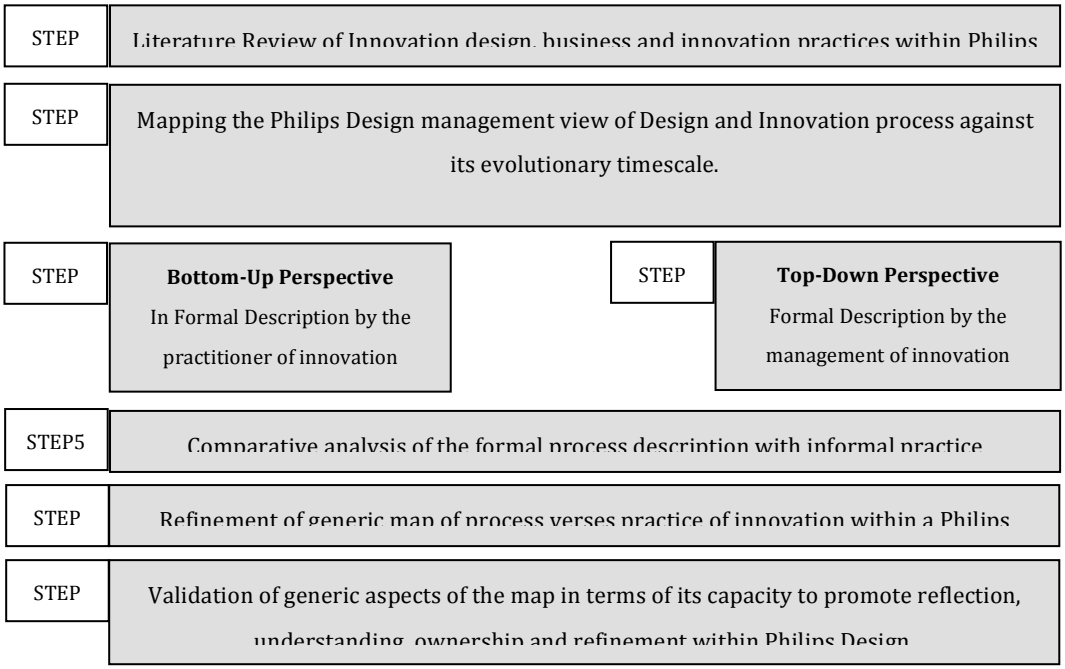


Figure 5: Structural view of the key steps of the research process design and the overarching methodologies selected for each step are described afterwards.

One on one interview (Yin, 1994a) is used to refine the outcomes of data collection in stages 3 to 6 and further a variation of Delphi Technique (Okoli C., Pawlowski S. D., 2004) is used for validation of data within Philips Design. It helps in comparative analysis of the data gathered. The steps within this are explained below:

Step 1:

The methodology starts with an internal literature review (Hart C., 2002), which outlines the different concepts of innovation in Philips Design. It focuses on data collection from the corporation, which includes a literature review of the past 10 years innovation programmes and events. This requires reviewing all the research papers, publications, power point presentations etc.

Step 2:

The data collected from Philips Design is very tacit in nature. To have a better understanding of the creative thinking within the corporation, it is important to arrange it chronologically, on a time line (Figure 7).

The time line highlighted the work of the design department within the corporation. In a span of 10 years it had achieved a number of milestones, most important being recognized as an important function for the corporation. Moreover, the timescale made it possible to visualize the increase in the role of design in the innovation thinking within the company. There were a lot of gaps in the data collected in this level.

Step 3:
The data gaps in the step 2 were filled in by step 3.

The generation of questions for mapping purpose was fed by step 2. It helped in filling up the knowledge gaps and also raised critical issues for the next phase. Semi-structured Interviews with stakeholders were carried out extensively to fill the gaps and make a better understanding of the innovation approach happening at Philips Design. All the information gathered, helped in realizing the innovation approach through graphical representation of its basic and most obvious entities (Hartly, 1982) and (Kress & Leeuwen, 1996).

The output of this level of methodology was laying down the information on an excel sheet (see attached sheet at the end of the document) with labels that require detailed information of each step of the innovation process. These enabled the next level of the mapping process and definition of best practices. The next step required mapping minute details such as the ownership, key inputs, and key activities of the Corporation business function and Design function respectively.

STEP 4:
Steps 3 & 4 fed into each other to complete the information and make the map concrete. This is where Delphi technique and one on one interview were applied extensively to ensure that the map was accurate.

Step 3 defined the details of the map through the interviews & information gathered during step 2. Step 4 defined the map as innovation was being practiced in the company while working on the themes for the future. Once these steps were completed there was a visible gap between the practitioners

and thinkers in the company.

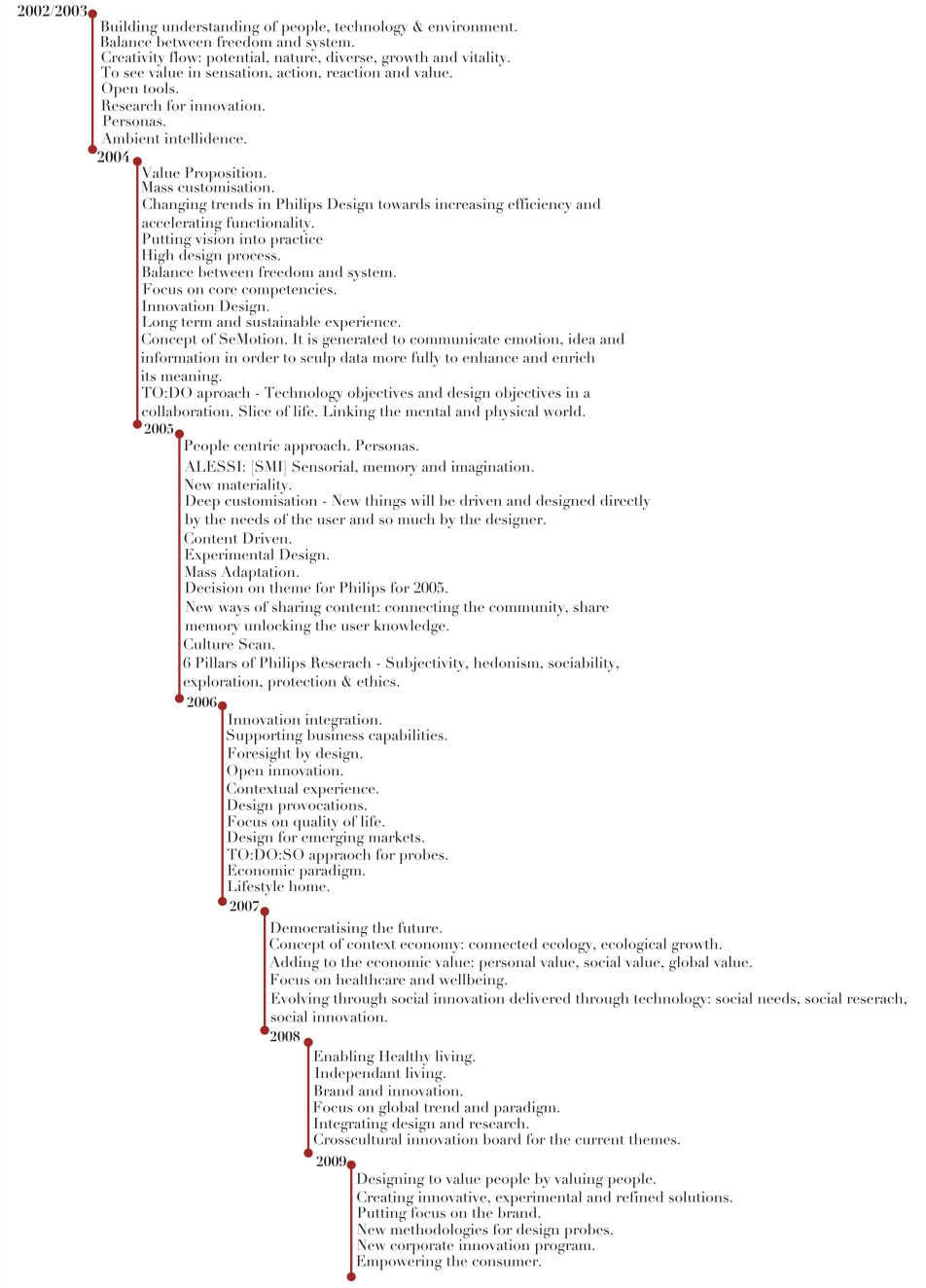


Figure 7: Time line of Philips Design

STEP 5:

This step completed the loop and helped in the comparison of logical data with the practical data to recognize further knowledge gaps in the information. This stage also helped to identify the most important practices within the system.

Step 5 involved in making a consolidated map of the innovation process being followed at the corporate level in Design function in Philips Design.

While carrying out this step the gap of communication and paradigm difference was made pertinent.

STEPS 6 & 7:
These steps were penultimate in validating the map. Where step 6 focused on consolidating the findings of step 4 & 5, which used one on one interview, Step 6 & 7 further, narrowed down the dimension of 'key inputs', 'key activities' for Design as a functional leading discipline in the corporation for the better understanding of the practitioners.

Step 7 entailed further interviews and workshops with the practitioners and stakeholders to validate the map within Philips design using the Delphi technique *(Sackman, H., 1974)*. Though the technique was slightly modified to suit the needs of the business environment. Further, the management of Philips Design had taken the responsibility to 'pilot run' the process at a practitioner level to validate it further. The results of which will not be certain till the end of 2011.

3.c Phase two: Knowledge Satiation

Phase two involved data triangulation between the literature review, outcomes of the case study and a third party expert who has the knowledge of the best practices of Philips Design as well as the knowledge of academics and other organisations.

The final mapping done in the first phase was used as an effective input for the second phase. This phase helped in validation of generic aspects of the map in terms of its capacity to promote reflection, understanding, ownership and refinement within Philips Design with a critical eye. It also helped in realizing critical questions and observations. The validation of the data acquired during the case study had to be judged critically. For this purpose, a list of questions was outlined *(Appendix 2).* These questions were from the literature review, past research and the case study. (Figure 3)

For the process of a semi-structured interview with an expert, the questions were arranged in categories. These categories would eventually feed into the

analysis process as answers to critical knowledge gaps as well as validation of existing data.

Categorizing the critical questions into the following:

- **Knowledge & communication competencies** – the focus is on the knowledge provided by the literature and it would help in analysing similarities and discrepancies within literature and practical experience in Philips Design.
- **Design strategy and creative competences** – The focus is on the creative thinking and design thinking within Philips Design and also a comparative analysis with the literature.
- **Team Competencies –** The focus is on team development and necessary evils within a team for an innovation process to move smoothly.

To see questions go to ***Appendix 1***.

To see transcript of interview go to ***Appendix 2***.

3.d Phase Three: Critical Analysis

3.d1 Selection of Companies:

The three companies for future analysis were selected based on the following key criteria:

a) Corporations serving diverse categories with a creative portfolio management team.
b) Corporations where design has a functional leading discipline role.
c) Corporations, which follow an innovation approach independently applicable to the organisation. Essentially in contrast to Philips Design's innovation policy.

Though a lot of companies fit in these categories, the focus is kept on the 3 following companies because of availability of contacts as well:

a) Company A
b) Lego
c) NCR
d) Procter & Gamble

3.d2 Structure of Interviews:

The interviews largely will be open ended and a questionnaire has been made for the purpose highlighting the main arguments that needs to be validated (Appendix 3). The questionnaire also consists of sub questions, which will be used to keep the conversation going.

The questions have been arranged in 3 broad categories similar to that in phase 2.

- Knowledge & communication competencies.
- Design strategy and creative competences.
- Team Competencies.

For questions please go to **Appendix 3.**

3.d3 Final Triangulation:

The same third party expert will also carry out the triangulation at this phase.

The inputs for triangulation at this level will be insights gained from organisation questionnaire (Phase 4) and outcome from phase 2 including literature reviews. (Figure 3) This data will be put forward as a presentation and a questionnaire to the third party. (Figure 15)

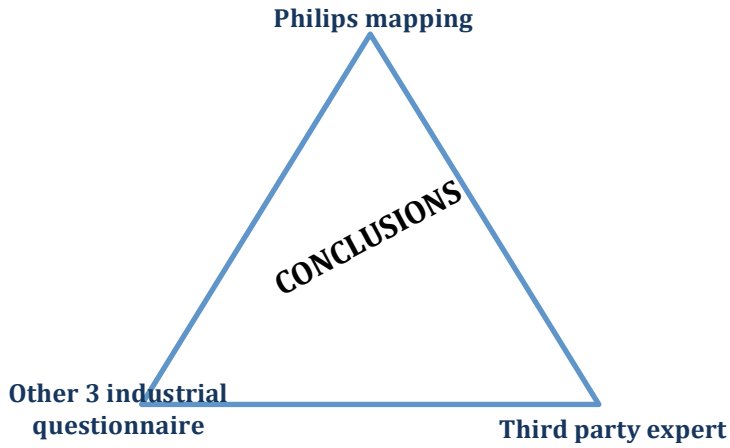


Figure 15: Triangulation for validation and analysis of the study.

4. Outcomes

Paradigm theory:

The theory of paradigms is supported by Robert Verganti's (2010) explanation of companies basing their strategy on increasing the 'value' of the product along with disruptive technology. The paradigm story[4] is what drives innovation in most companies.

Innovation starts as a technological paradigm for most of the corporations. But with globalization and other external factors the companies aspire towards new innovation paradigms; such as experience, knowledge and transformation. (Figure 11)

Most companies following design driven and multi brand innovation aim to be in the 2nd paradigm, which is the 'experience paradigm'. Jeffery Phillips *(2010)* supports this thought, when he talks about making user centred products. Most companies follow their intuition to get to the desired paradigms. But Philips Design wants to tackle it with the innovation process being mapped. Different types of innovations are possible in these paradigms like product, business, service, network etc. But the key to success is future thinking, effective communication, smooth knowledge transfer, and defined perspectives to evaluate the paradigm story.

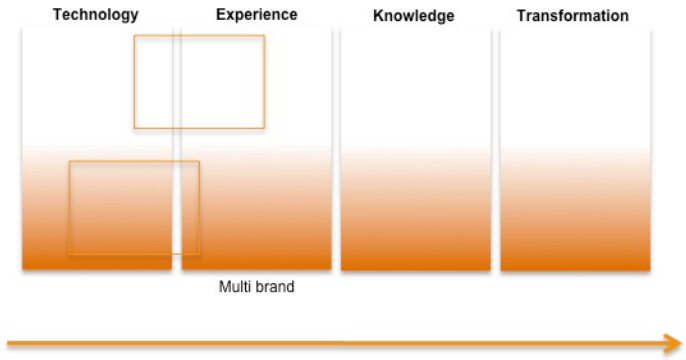


Figure 11: Innovation paradigms

The Matrix system:

The aspiration of Philips Design to move towards the 'transformation paradigm' they based their innovation process on the understanding of 4/4 matrixes that defined the different levels of approaches to innovation at Philips Design. The matrix system of measurement of innovation was based

on the innovation roadmap diagram. Philips design's innovation structure is defined within all the three circles. The diagram defined the innovation architecture of Philips design in relation to the product cycle and its innovation type (Figure 14).

Around 65% of the businesses per year are generated by Incremental innovation in the company, predominantly guided by the "high design process". The high design process guides the sector level product design and marketing process. In spite of the profit quotient, Philips design wants to concentrate on the sector of breakthrough innovations. The products and services that do not fit in the break through circle gets in the business through the adjacent innovation circle which generally is a technology or an idea which is new to Philips, or an addition in the category. It helps in the growth of the business but not so much in creating blue ocean strategies (Kim and Mauborgne, 2005).

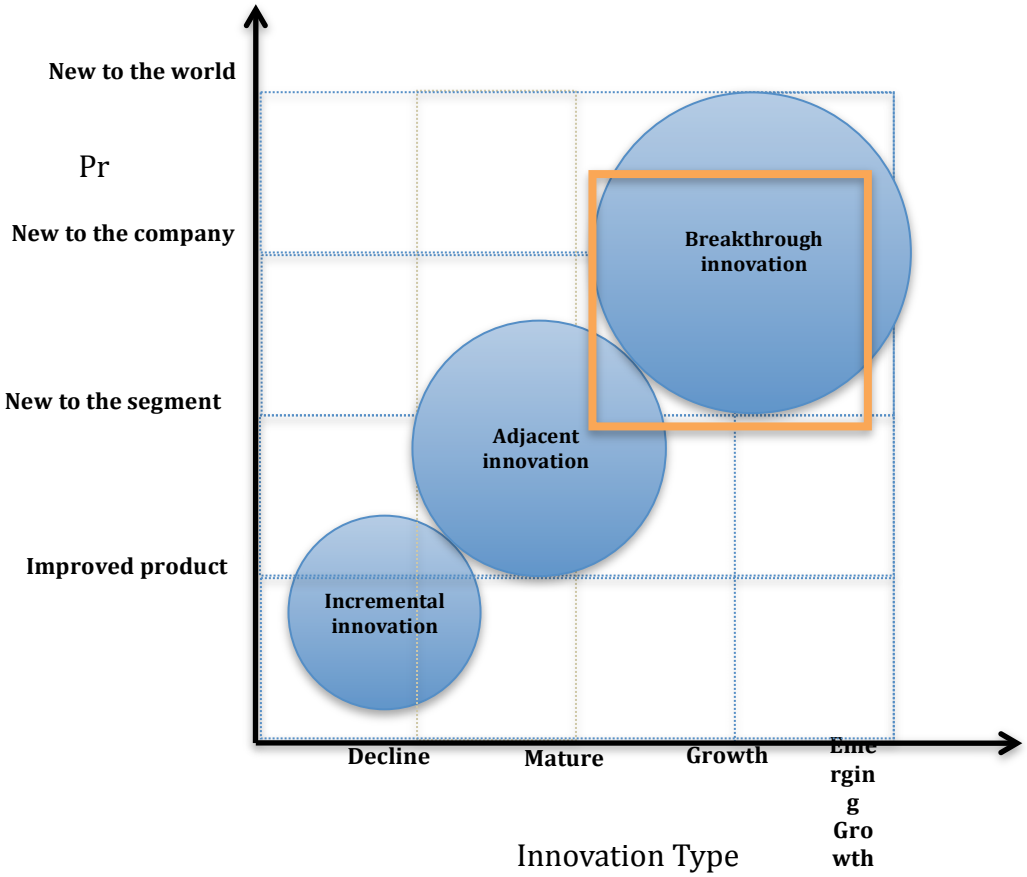


Figure 14: The innovation model.

Graphical representation of the innovation process.

The breakthrough innovation can be achieved by a series of approaches that facilitates the development of right kind of knowledge, thinking and skills. One of the outcomes of the case study methodology was a graphical representation of the innovation processes being followed at Philips design to enable the required thinking. This graphical representation was a combination of the processes, which already existed within the businesses along with some technical improvements to make it more resonant (Figure 15). The map also represented the formal as well as informal communication channels existing within the process.

The innovation process was developed to 'review, plan and develop Value contribution development' for Philips Design. This process was the core process being followed at the strategic level, which integrated design within the business. The process also aimed at making a creative portfolio for Philips Corporation with added value and futuristic applications.

Further iterations of the process were made to develop and identify the communication link between Philips Design with the other disciplines and departments in the business. It depicted the inflow and out flows of tacit as well as explicit information within the departments making sure the entire sub processes are articulated along with their functions.

In addition to that there was also a detailed explanation of the map in an excel format. This detailed map described the process within certain variables. The variables were selected by the management and the researcher to make sure that the map reflects on the integrities of its functionality and would be helpful in the future as an auditing process as well.

The detailed map went through a lot of iterations owing to the methodological steps 3 and 4 and 5, which led to a lot of changes in the map.

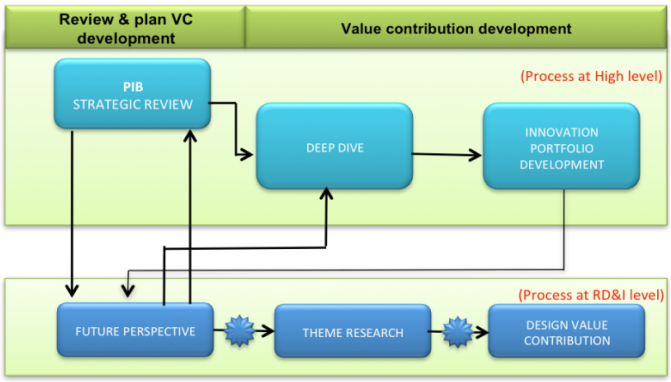


Figure 15: Value contribution graphical map of Philips design innovation

Philips Design Gartner's Hype Cycles theory:

Philips Design has its own interpretation of Garner's hype cycle theory. This theory has three horizons (Figure 14). These three-horizons, function at different levels of the pyramid of growth. Horizon one is managed by the practitioners with a bottom up pull approach with their main motive to defend their core business. Their focus is on the current to 2 years ahead. Horizon 3 is for the thinkers with a top bottom push, which takes care of creating a viable option for future business. Their focus is on the time span of 20-30 years.

In practice there is a visible gap in horizon 2, which suffers from disillusionment. This gap is backed up by a lot of research but still does not connect the thinking of the corporate strategy. Hence, the gap between the thinkers and the practitioners is a problem, which is a hindrance to a concrete innovation structure.

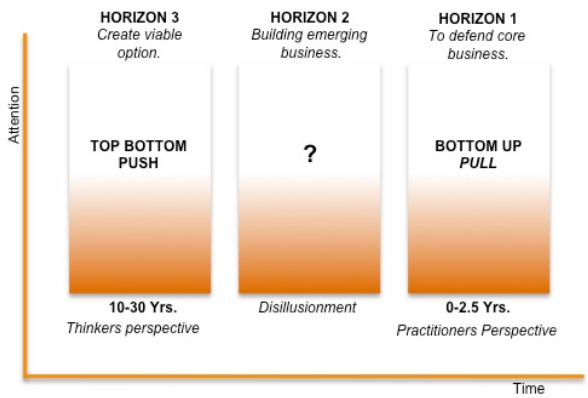


Figure 14: Paradigm story and gap

Design Perspectives:

Philips Design bases its ‘design innovation thinking’ on six, predefined perspectives. These perspectives were lost in translation in Philips Design. (Figure 15)

Brand is given the highest priority followed by marketing platforms within the company and identified value spaces. Customer experience context is followed by formal value proposition and finally competence development for the future. It is agreed that these perspectives are an important part of the Philips Design innovation process as they form the backbone to achieve the desired innovation approach. The perspectives guide them while making important decisions within the process.

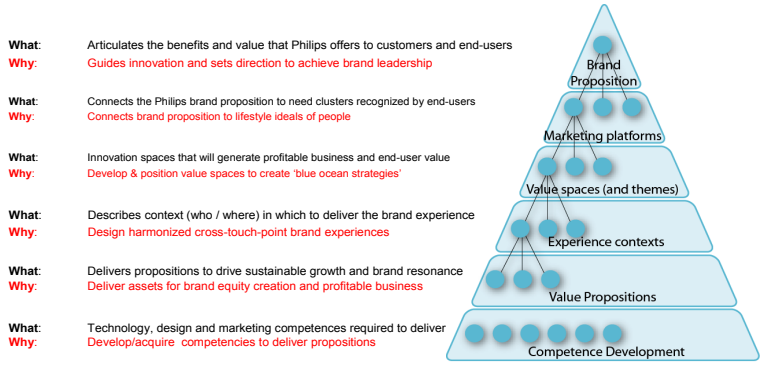


Figure 15: Pyramid of perspective for innovation by Philips Design

5. Contribution to knowledge

The research’s primary audience is comprised of those who practice ‘design driven innovation’ in corporations. These individuals and teams may not have received traditional design education or may not even be called designers themselves. Nevertheless, they can identify this research as beneficial, as it will act as a guide for the practitioners. The topic will immensely interest ‘design-led researchers’; as well as business and management researchers and students. The research will also be beneficial to ‘aspiring doctoral candidates’ who are looking for further intriguing gaps in knowledge as the thesis highlights some overarching questions, which are beyond the scope of this research.

Keeping the above in mind the current research contributes to knowledge in 4 broad categories. First is by keeping the philosophy of Roberto Verganti

(2009) and taking it a step further by highlighting challenges attached with design driven innovation. It is a new knowledge as Roberto Verganti talks about design driven innovation as a theory and a philosophy, however its implication when it is actually practised is explored in this research.

The mapping helps to find effective techniques that would be useful to bridge the gap that exists between, the thinkers who try to define new competencies for the business and, practitioners who work to defend the core business. This knowledge will act as a technique to avoid the major problems.

Third is the knowledge of mapping innovation process from a design perspective. Through the literature it has been seen that strategic mapping in corporations is the work of business and management studies. And this is the first time that design is being used to map and make the innovation process more explicit.

Last but not the least it identifies some new knowledge and highlights new areas of research, which would make the theory of design driven innovation manageable and attainable.

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DESIGN AS A FUNCTIONAL LEADER: A case study of Philips to investigate the potential of design as a leading functional discipline.

Mersha Aftab,
Northumbria University, Newcastle Upon Tyne and India
m.aftab@northumbria.ac.uk

Professor Robert Young,
Northumbria University, Newcastle Upon Tyne and India,
robert.young@northumbria.ac.uk.

Elizabeth MacLarty
Northumbria University, Newcastle Upon Tyne and India,
Elizabeth.maclarty@northumbria.ac.uk

Abstract

This research investigates the role of design as a functional leader in multinational industries, to drive innovation successfully at a strategic level. It involved a detailed case study of the innovation process, and practices within Philips Design based in Eindhoven, The Netherlands, where design is a key decision making function within the company but not yet recognised as a leading discipline at strategic level. Philips Design wanted to use design research to build an integrated map of its actual practices and correlate these with other corporate innovation practices, to help establish strategic recognition for their value. The doctoral challenge was to explicate the process and determine whether the findings have generic capacity to support the role of design as a functional leading discipline.

The investigation integrates an iterative loop of; abductive reasoning of design thinking and inductive reasoning of management thinking in an action research cycle. The case study was part of an empirical enquiry, where the researcher became a participatory observer at Philips Design, conducting one-on-one interviews for data collection and refining their analysis using a Delphi Technique. Three other multinational organisations were explored to take into account how each perceives the contribution of design and the different roles it plays in their organisation. Data triangulation was also used to validate findings with a third party expert.

The research contributes to knowledge by confirming the conditions for design to act as a leading functional discipline. It shows that design cannot be the only functional

lead for a multinational organisation. It identifies the major reason for this as the difference between thinkers trying to find viable options for the future and practitioners trying to defend the core business in their organisation, resulting in a gap between strategy and operation. The research further elaborates on the reasons for the gap to exist through qualitative conceptual relationships between designer behaviour and organisational culture in the different innovation cycles that exist in the organisation.

KEYWORDS: Design Leadership, Innovation, Design Innovation, Design strategy

Introduction

This paper derives from a programme of doctoral research that investigated if design could be established as a leading functional discipline[60] in multinational organisations[61]. The desire to conduct this research was driven by an opportunity to work on a nine-month internship to map the innovation culture of Philips Design[62], while being a part of their strategic team called Research Development and Innovation (RD&I). Philips Design, based in Eindhoven, The Netherlands, is a good example of an organisation that recognises design's value as a function[63] and wants to establish it as one of the leading functional disciplines in the Philips Corporation. The focus of this paper is therefore the study of this aspiration within Philips Design.

The study reviewed the RD&I design innovation process being applied using 'design driven innovation' (Verganti, 2009) at the strategic corporate level in Philips, to make and develop future propositions in the hope of establishing itself as a leading functional discipline. Despite this operational platform and approach, design functional leadership was found to be full of problems of ambiguity,

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[60] Leading Functional Discipline – Refers to a concept where design discipline holds functional leadership role in organisations by establishing an explicit process for successful leadership. While holding this role the multidisciplinary design team leads the organisation and collaborates with other recognised disciplines while doing so. See: Aftab, M. (2012) & Adair (1990).

[61] Multinational organization – Dictionary (oxford) defines multinational as an adjective and a noun stating; an organisation operating in several countries. In this study, I use multinational to define organisations as having several research and development centers around the world despite its headquarters being in the city of its origin.

[62] Philips Design - Philips Design specifically indicates the team called Research Development and Innovation (RD&I) and the design function within the Philips Corporation.

[63] Function – Design function represents design being recognised as a core discipline in any organisation. Any organisation recognizing design as a function gives it equal importance in comparison to other functions like R&D, technology, strategy etc. Design as a function is able to add more value to the decision making of an organisation than when it is in a support role or acting as a consultant discipline. See: Ling, B. (2009) What role does design play within your organisation? *In:* Bobby (ed.) Design leadership. Design sojourn.

discontinuity, lack of alignment and ownership. The study concluded with an innovation process map, explicitly defining the actions and problems at each step of Philip's value proposition and development process (Aftab, M., 2012).

The finding was correlated by questioning the way design worked in three similar multinational organisations; Company A, a consumer goods company based in Finland, Company B an airline manufacturing organisation and Company C an automotive manufacturer both based in Germany. This paper compares differences in the thinking of these three multinational organisations with the detailed case study within Philips Design and the role of RD&I.

The study concludes that design can only be an effective function if it is recognised by other core functions of the organisation. Additionally, the design function cannot be aligned with strategic level leadership and given the status of a functional leader.

Functional Leadership Theory (FLT) and its Practice

FLT was first developed at the Royal Military Academy, where training in the responsibilities of leadership was a part of a programme for officers. The training was later transferred to business organisations and was famously known as Action-Centered Leadership (ACL). Adair (1990, p. 9) provides the initial theory for action-centered leadership stating:

> *"...I have developed the idea that working groups resemble individuals in that although they are always unique...yet they share, as do individuals, certain common 'needs'. There are three areas of need present in such groups. Two of these are the properties of the group as a whole, namely the need to accomplish common tasks and the need to be maintained as a cohesive social entity... The third area is constituted by the sum of the individual needs of group members."*

Adair (ibid p. 13) identifies that the three areas of need overlap and influence each other. He mentions,

> *"The value of the three overlapping circles is that they emphasize the essential unity of leadership: a single action can be multi-functional in that it touches all three areas."*

Adair (ibid p. 13), pinned down a single list of leadership duties representing its functional characteristics. He claims that the list would help in navigating through the overlap of group needs and individual needs. This list was adopted from the Royal Military Academy Sandhurst, which has been useful in many other organisations. Adair's (ibid) list indicates the following;

> *"The list of leadership functions:*

- *Planning*
- *Initiating*
- *Controlling*
- *Informing*
- *Evaluating"*

Since Adair's (ibid) version of ACL/FLT, scholars have interpreted it differently. Zaccaro and Klimoski (2001, p. 24) identify three relationships to the success of functional leadership and other models of team leadership. The first, focuses on functional leadership as a boundary role linking teams to their environments; the second, suggested that leadership functions are necessary when there are problems within the team, and the third, functional leadership is defined by behaviour that assists the team in problem solving (2001, p. 24). Zaccaro and Klimoski (ibid) developed a framework that states:

> *"Leadership influences team effectiveness via its effect on team processes. i.e., cognitive, motivational, affective and coordination". The leader functions that have an impact on team effectiveness are:*
>
> *Information search and structuring,*
>
> *Information use in problem solving,*
>
> *Managing personnel resources,*
>
> *Managing material resources."*

The Air Training Corporation (2010), another company that is using functional leadership in its strategic management states that:

> *"The functional approach to leadership is the ability of a leader to manage a group to complete a task whilst keeping the group working as a team or developing the group into a team and satisfying the requirement of the individual group members".*

Where Kotter (1998) believes that generally leadership connects the vision of a leader to the alignment of employees at the bottom of the hierarchy; Musa[64] (2010) develops the theory provided by Dreikorn (1961) and claims that FLT is a model that concentrates on how leadership occurs. Dreikorn[65] (1961) stated;

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[64] Musa, M. (2010) Analysing leadership theory in a social psycological perspective. *In:* Astuti, D. S. R. (ed.). Bandung: Padjadjaran University. A PhD student in Indonesia researches on adolescent sexual behaviour, in relation to value-systems. His paper on functional leadership is relevant to the study and has thus been used extensively. However, I would like to point out that the context of his study is different from the current research.

[65] Dreikorn, M. J. (1961) Integration. *In:* Dreikorn, M. J. (ed.) *The synergy of one: Creating high-performing sustainable organizations through integrated performance leadership.* Milwaukee: ASQ. – There is a lack of horizontal alignment between functions in an organisation when it is structured under functional leadership. This theory provides tools like 'homeroom leadership' for the alignment to be made possible while maintaining the characteristics of a functional leadership structure.

"In the functional leadership model the functional disciplines are enablers, not executers, of process...with the functional disciplines and process executers aligned throughout the processes, their primary focus is consistency in action, integration throughout the system, and sustainability of performance."

This theory is very commonly used in practice in organisations like Lufthansa, Philips Design, and Company A, though it might not be known by the same term. Philips Design integrates design in its functional leadership development programme by using 'design driven innovation', (Verganti, ibid), to drive creative exploration and collaborative instigation. The innovation strategy at Philips Design is further communicated through the story of 'horizons' (Figure 1).

These horizons are derived from a 4/4-matrix diagram used by organisations relevant for this study for creating innovation strategies. Figure 2 shows how Philips Design places these innovation cycles in relation to time (x axis) versus market life cycle (y axis), to analyse where new ideas could be placed and what product life cycle it could belong to, in relation to time.

These horizons work in three different time spans and each horizon has a dedicated set of designers. Designers working in Horizon 1, defend the core business, by doing projects that have to come into the market between zero to two years following a bottom-up approach[66]. Horizon 2 should be a comfortable path towards the future, but on the contrary, a big gap exists between the present and the future. This is due to the involvement of other stakeholders, unknown to design, and oblivious to design activities. Horizon 3, works with ideas that create viable options for the future run by the thinkers following a top to bottom approach[67]. These horizons are superimposed with a Gartner's Hype Cycle[68]. This is done to study why there is a gap, between the thinker's top-to-bottom approach, and the practitioner's, bottom-up approach.

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[66] Bottom-up approach: Refers to incremental innovation on product cycle, which has the ownership of the practitioners. The practitioners defend the core businesses creating innovation required in the market in the span of 2 years. With a short time span to work on bottom-up approach has its own rules, processes and teams that defines that cycle. See: Aftab (2012).

[67] Top-to-bottom approach: Refers to breakthrough innovations on product cycles which have the ownership of the thinkers. The thinkers are strategists who are responsible for exploring future value spaces and proposing ideas for emerging markets. Once an idea is proposed it goes down to the practitioners to be rolled out in the market in a suitable time and market. See: Aftab(2012).

[68] Gartner's Hype cycle: Refers to the social applications to specific technologies. These cycles can separate hype from reality and help strategic leaders to decide whether or not particular technology is ready for adoption. The hype cycle is driven by two factors: human nature, and the nature of innovation. See: Fenn and Raskino (2008).

Though other functions have adapted to the functional leadership programme[69] at Philips, empirical evidence suggests that design struggles in its role as a leader due to the gap in horizon two.

Design and its Strategic Roles

Design provides the benefits of creativity (Fujimoto, 1990), interpretation (Schmitt et al., 1995), communication (Trueman and Jobber, 1998) and integration (Nelson and Winter, 1977, p. 150) beyond just observation, and makes the observations and explorations visible to the organisation. Trueman and Jobber (1998) grouped the role of design in an organisation into four dimensions; value, image, process and production.

Design has been famous for two predominant roles at the strategic level of an organisation; first, for being a product and services differentiator and second, providing valuable contributions of design to organisational structure. Regrettably, Stevens et al. (2008, p. 2) state

> *"...Much business strategy literature predates or neglects these trends, and in the empirical literature of design management they are often discussed under the catch-all of 'strategic."*

Lorenz (1994 p. 33) gives the example of the chief design officer for Sony in 1980's who had been given an additional duty of coordinating the developments of products. This showed that industrial designers in their most traditional sense were highly multidisciplinary and could play the role of unique glue for a corporate process of product development. At Philips, design takes up a similar multidisciplinary approach when it is aligned directly to the Philips Innovation Board[70] (PIB) comprising the head of all recognised functions namely technology, strategy, marketing, and design (Figure 3).

According to Gardien (2009),

> *"The PIB operated at the strategic level where the chief design officer formulated design strategy in accordance with other members of the team. The PIB then connects to the rest of the organisation through its core*

[69] Functional Leadership Programme – A programme developed in order to align all functions within Philips. This programme establishes design as one of the leading functional disciplines. It requires design to align its activities and processes explicitly within the Philips innovation framework. Within this programme all strategic level processes, core level processes and support processes are audited. In: Gardien, P. (2008a) Company innovation program 2009. Eindhoven: Philips B.V.

[70] PIB – Philips Innovation Board also known as PIB at Philips, which comprises of the head of the recognised functions along with the CEO of the organisation. These recognised functions at Philips are: strategy, technology, marketing/futures, and design. This committee takes important decisions of the organisations innovation strategy that is then transferred to the RD&I team. See: Gardien, P. (2008). *RE: Design research for innovation.* Type to Design, P.

processes run by the RD&I innovation process of value proposition and development."

Philips Design claimed itself to be 'technologically driven' but the corporate policy pushes a brand driven strategy through all its functions. This is done to promote brand image and the essence of 'sense and simplicity' through all levels of the organisation. According to Brand, R. (2009),

"The involvement of design in the core processes of 'value development and proposition' for Philips led to the 'brand' becoming a priority in the construction of its process."

This is further highlighted in Philips Design's, Innovation Architecture (Figure 4) that describes the psychology behind making brand as the internal strategy to keep all levels connected to the main essence of the organisation.

Supporting this philosophy, Abbing (ibid) believes that combining design and design management to the brand's ability to connect, leads to transformation of abstract ideas into reality. In the past brand has been linked to logo design. It is only recently that brand is being talked about as a strategy that belongs to top-level management. Branding is seen to have a connecting feature that holds together the inside and outside world of organisations with their innovation and marketing functions.

Additionally, Kapferer (2004) & Olins (1978) discussed the gap between the company's identity[71] and image[72], and they claimed that New Product Development (NPD) could be used to bridge this gap. This embedded the use of design in branding further in conveying identity to consumers by its 'products, people, places, and communication' (Abbing and Gessel, 2008, p. 10). Olins (1988, p. 56) took a more traditionalist approach and stated that,

"A product is a message, environments and literature affect the issue peripherally but it is primarily the product that dominates and conveys the identity idea."

In corporations like Philips, innovation guides business direction, this is in line with their mission and strategy (Gardien, 2009). Brand, R. (2009) believes that the innovation architecture promotes the concept of brand leadership, not in the conventional sense of branding, but in the sense that brings out the essence of the values, of the organisation through its products, and adds meaning of 'sense and simplicity' in its customers lives. Brand, R. (ibid) states that,

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[71] Brand identity –refers to the essence of the brand that comes when the external environment of the organisation is in perfect harmony with the different internal functions of the organisation, especially marketing and innovation. See: Abbing, E. R. (2010) *Brand-driven innovation: Strategies for development and design,* CH, Ava Publishing, 12.

[72] Brand Image – refers to the face value of the brand towards its customers through its visual tools like logo etc. See: Lury, C. (2004) *Brands: The logos of global economy,* Abingdon, Routledge, 63-65.

"It puts design in a position, to guide the corporation towards, the achievement of brand leadership by connecting the company with its users. Following which organisations form a better understanding of their positioning in the different identified marketing platforms in the lifestyle mapping (Figure 5)."

Philips Design has developed a sound understanding of the evolution of the economy from the industrial economy to transformational economy and the importance of design leading this evolution. Brand & Rocchi (2011, p. 11) claim that Philips presently stands in the knowledge economy, where

"Knowledge is not just a string of information but is constructed socially, discussed and shared".

Brand and Rocchi (2011, p. 8) further state that,

"These emerging paradigms in value creation have far reaching consequences for the future vitality and comprehensiveness of organisations. Many companies naturally tend to create future strategies and innovation roadmaps based only on their existing paradigm, which often does not exploit the full potential available".

The study confirmed that Philips is moving through the 'experience economy' and Philips Design aims to leap to the 'transformational economy' in the coming decade. With the marketing paradigms recognised, the Philips Design team tries to use the initial steps of their design innovation process to establish 'value spaces' (Brand, 2009). These 'value spaces' are the themes of the future, which the company works on. Unfortunately, despite having immense knowledge to drive innovation through design, the gap in the 2nd horizon takes a toll on these efforts and leads to loss of ideas and slow innovation.

Methods

The research started with a field study, which involved an internal project with the RD&I team to define, refine, and explicitly communicate the innovation process of Philips Design at the strategic level. The methods that were used for the research are chiefly inspired and informed by the works of; reflective practice, (Schön, 1983), creative mapping techniques (Buzan and Buzan, 1989); and radical constructivism (Glanville, 2005). Figure 6 illustrates the phases and the reflective loops in the research design.

The case study investigated the role of design function under the functional leadership programme at Philips Design, while it led the organisation into creating a knowledge based creative portfolio. This was done while mapping the innovation process and its practices in a multinational organisation, to promote reflection, understanding, ownership, and refinement by stakeholders within the organisation. As stated earlier, the case study highlighted the existence of a gap between the

thinkers who find new options for the emerging business, and practitioners who work to defend the core business. Keeping that in mind, these two groups of people were questioned separately.

Further, three companies were selected and explored and their data was compared and contrasted and then triangulated with the third party expert to validate the outcomes.

The research used mixed methods to collect and analyse data (Figure 7). The data collection methods included; case study (Yin, 2003), Delphi technique (Sackman, 1974), one-on-one interviews, and extensive literature review grouped together under an action research cycle. The data validation process includes exploration of other organisations and data triangulation with a third party expert. The qualitative nature of the data, led to a, complex data analysis supported by 'designerly' methods of mapping (Saikaly, 2005; Yee, 2009).

Findings

It took ten years for Philips Design to transform design from a contract-based[73] entity to a recognised function. The most important aspect of design's role at Philips was its formal establishment as a function and promotion as a leading discipline. Philips Design was able to do this by including design's contribution in Philip's functional leadership program, which aimed to align all the leading functions together at the strategic level. The main purpose of this program was to enable each of the important functions, such as, technology, futures, business, design and R&D to be integrated to the corporate mission.

As mentioned, the function of design at Philips was involved in conducting 'value proposition and development' for the corporation. This enabled design to perform one of the core processes. The core process involved the RD&I team at the strategic level to develop proposals for an innovation portfolio for Philips that enhanced the brand image of the organisation. Figure 8 depicts the positioning of the core process of 'review, plan and development of value contribution' being run by the RD&I team, which integrated design within the business.

The core process carried out by RD&I ran under the strategic process, itself carried out by the PIB involved in reviewing and developing design strategy for Philips. These important decisions were then transferred to the RD&I team for development and proposition of value for the creation of a creative portfolio.

[73] Contract-based – Design is not a part of the organisational structure but works as an external entity. Design as a contract-based entity is called in to work on specific projects over a limited time period. The designers do not have any control on how the organisation works and no role in formulating strategy. It was only in 2008 that Man and Jung introduced the idea of design contributing to organisational strategy while being a contract-based entity. See: Man, K. Y. & Jung, M. J. (2008) Bottom-up design leadership as a strategic tool. *Design Management Review,* 19**,** 59 - 67.

The RD&I process involved other stakeholders and was followed by the support processes by other functions in the organisation. The core process of RD&I provided design leadership and intelligence at Philips.

The case study explicitly defined the process and converted it into a graphical format. As seen in figures 9, 10 and 11, the RD&I innovation process divided into three broad actions. The first one called 'future perspective' undertook people and trend research defining possible growth areas, insight for design exploration and explored future areas through design probes (Figure 9). The second is 'theme research' that interrogated growth areas by carrying out experiments and developing knowledge and competencies; it also obtained stakeholder insight on the desirability of the concepts through application experiments (Figure 10). And the third one, called 'design value contribution', supported platforms for new business, by developing stakeholder solutions that contribute defendable intellectual property (IP) and new ideas along with their concept plans (Figure 11).

The next step of RD&I was to enhance this role and turn the design function into a leading functional discipline. As such, design would be considered as one of the core entities generating value for an innovative and creative portfolio. This would ensure that design activities are integrated in the corporate mission statement through a multidisciplinary team working closely with all other recognised functions.

However, contrary to this role, the research saw problems within the function of design. The biggest of all problems was the gap between horizon 1 and horizon 3, i.e. between the thinkers and the practitioners. This gap led to a lack in Philips Design being involved in creating benchmark innovation practices and techniques for breakthrough innovations. The new techniques of innovation were not being documented and passed on into the 'new ways of working[74]' and the 'body of knowledge[75]' within the organisation leading to a lack of communication of the value addition by the design function in the innovation architecture of Philips (Brand, R., 2009).

The design function was seen struggling to become a functional leader at Philips Design as other functions did not recognise its contributions. Additionally, the research also found that other organisations did not recognise design's ability to even become a function. A problem related to the role of design in the eyes of case-study Company A was the business model and its reporting structure. In Company A, the design head reported to the Chief Technology Officer leading to a culture

[74] New ways of working – 'New ways of working' is a term used at Philips Design that signifies tools discovered while they carry out their innovation process. These tools help them engage with ground breaking innovative products in new cycles.

[75] Body of knowledge – Philips Design maps and stored all ideas and value generated in the form of process papers and presentations. These papers and presentations are circulated within Philips and stored as their body of knowledge.

and communication gap in the working style of the design team. Additionally, design was integrated with other functions of the organisation through their communication channels. Despite this, it was given less privilege to play with the assets of the organisation.

Former head of design at Company A thought that there are certain solutions to these problems. One of which was to have a good team with inspiring and intelligent people. On the other hand Company C believed that just having a team is not enough, a team needs fixed roles that each individual plays to accomplish a well-defined goal. Head of consumer research center at Company C agreed that this is not easy to accomplish and stated,

> *"the mission and vision of the company is well defined and everybody knows their roles and acts with responsibility."*

Organisations that depend on technology like Companies B & C, use design as a support function and cannot see design holding a position as a functional leader unless it is shared with other functions like technology and research. The research confirmed early on that technology, research, and development (R&D) were central to value development in most organisations, and for design to lead it had to start by playing the role of a co-function to research and technology. Company B tried to create a collaborative environment between its functions to facilitate a successful work culture through training its employees, identifying roles for its stakeholders, creating rules and a fixed process that helped identify themes for the future portfolio for design projects.

Empirical evidence contradicts design's ability to lead an organisation solely based on its own competencies and knowledge. Nevertheless, design's ability to envisage the future is particularly important for organisations like Philips looking to develop future propositions. Hence, design's involvement at the start of the decision-making process enables the team to imagine the context of all new technological application. The research claims that it is important for one function to lead the decision making process, whilst all functions get equal authority, including design.

Conclusion

FLT is still in its nascent stages of practice in organisations that have applied it in their work culture on a daily basis. This research studied the application of FLT to design and its leadership role and has concluded that the functional leadership of design can be established only when (Aftab, 2012 p. 146);

> *"the organisation and functions within the organisation, i.e.: technology, strategy, futures, and marketing, acknowledge design as one of the core entities generating value for the innovative and creative portfolio. Once design is recognised as a function, it needs an internal team aligned with the strategic decision making team. This design team should represent, and*

ensure, that all expected tasks aligned with the function of design are utilised properly and delivered in the right direction".

This research did not discuss the comparison of different functions and the way they work in relation to design teams. It also did not take into account the people and the skills they require to do the job in design teams at a leading functional level in organisations, making these areas important for further research. Additionally, the study has also opened the door for further research on the use of design as a function and its far- reaching implications for idea generation, the process of innovation and other corporate functions. Due to the limited timeframe of this study, it has not tested FLT in other organisations. Hence, there is a need to explore this field further to enrich the discussion and the current conclusions with further data.

Figures

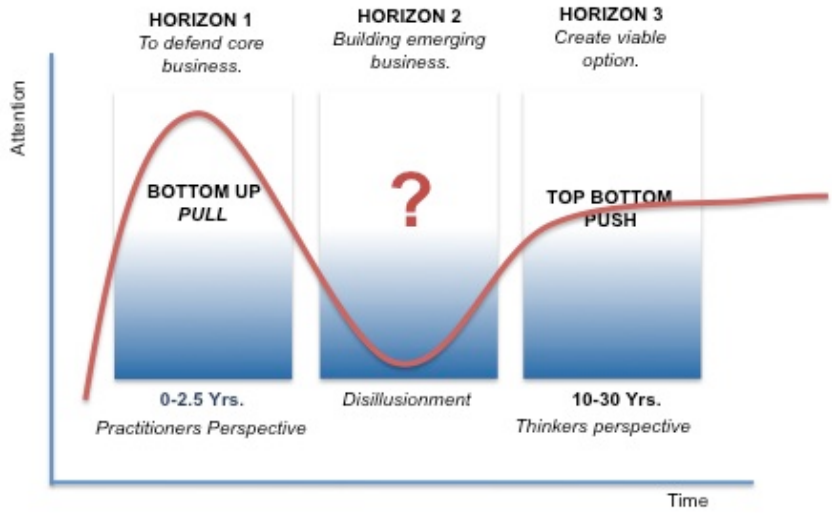

Figure 1: Philips context - Derived from The Alchemy of Growth (Baghai et al., 2000).

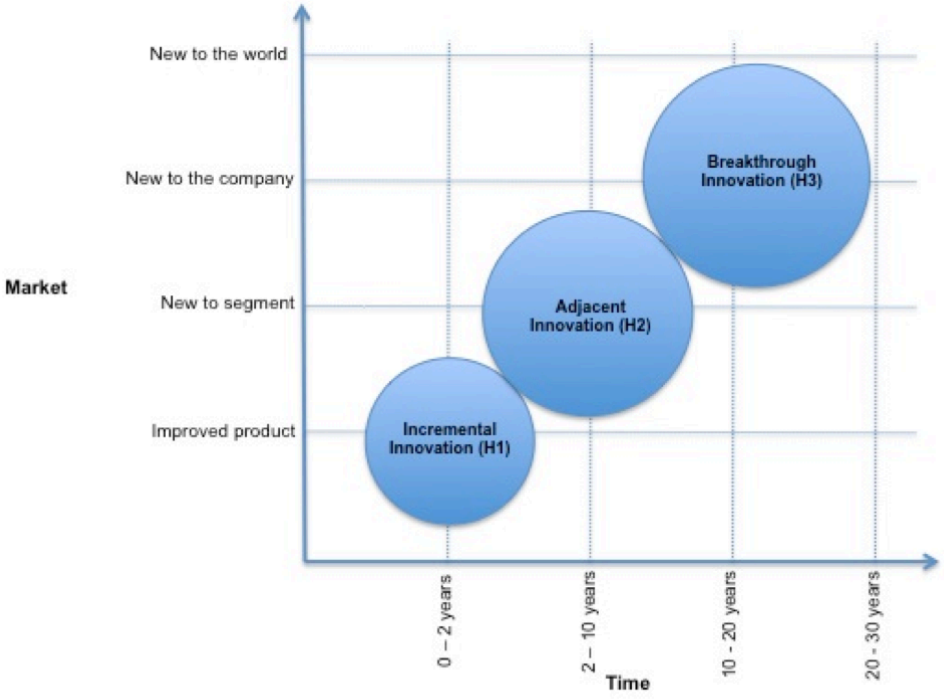

Figure 2: Innovation Cycles at Philips Design (evolved from: (Cawley, 2010b; Gardien, 2009))

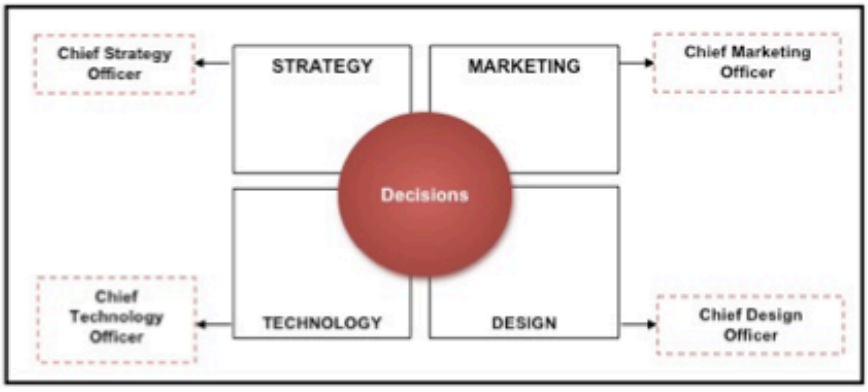

Figure 3: Corporate functions (PIB) Gardien (2009)

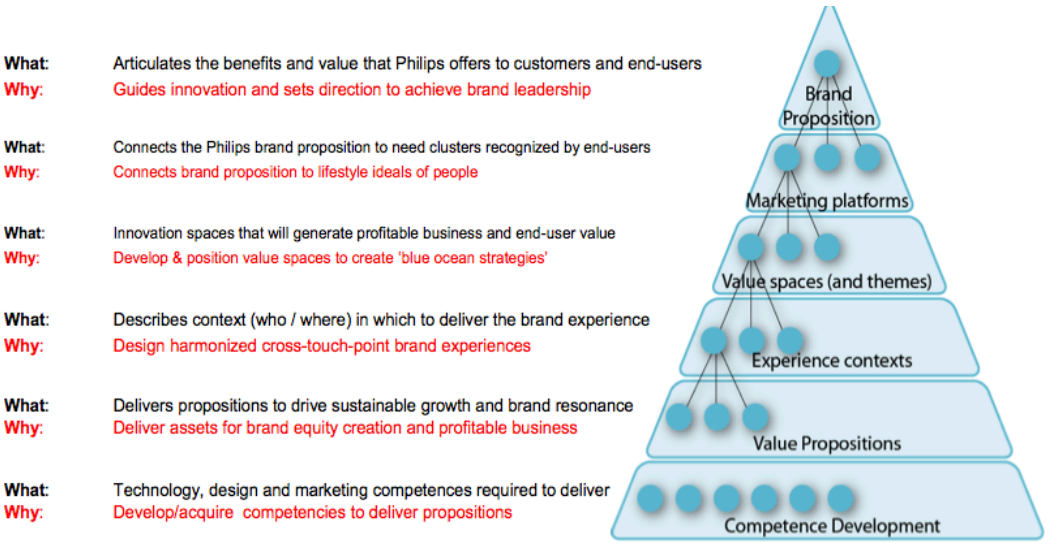

Figure 4: Innovation Architecture at Philips Design promoting Brand Leadership (Brand, R., 2009)

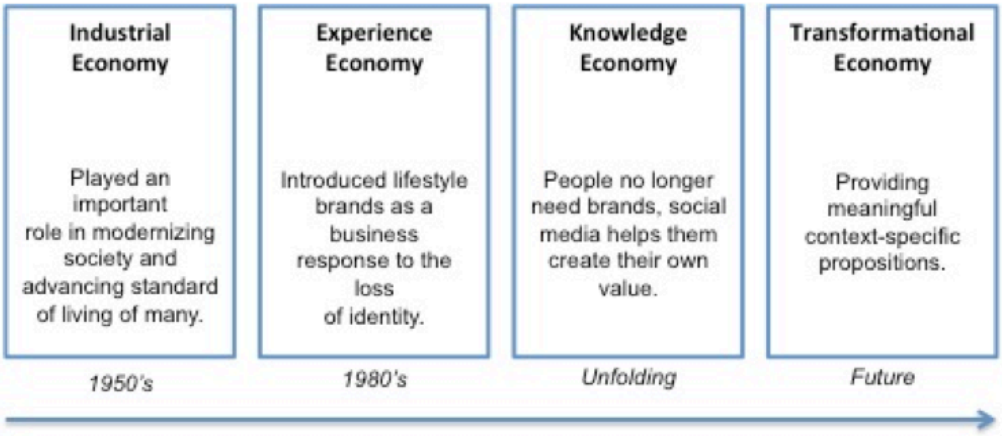

Figure 5: Marketing platforms/paradigms for lifestyle mapping (Brand and Rocchi, 2011).

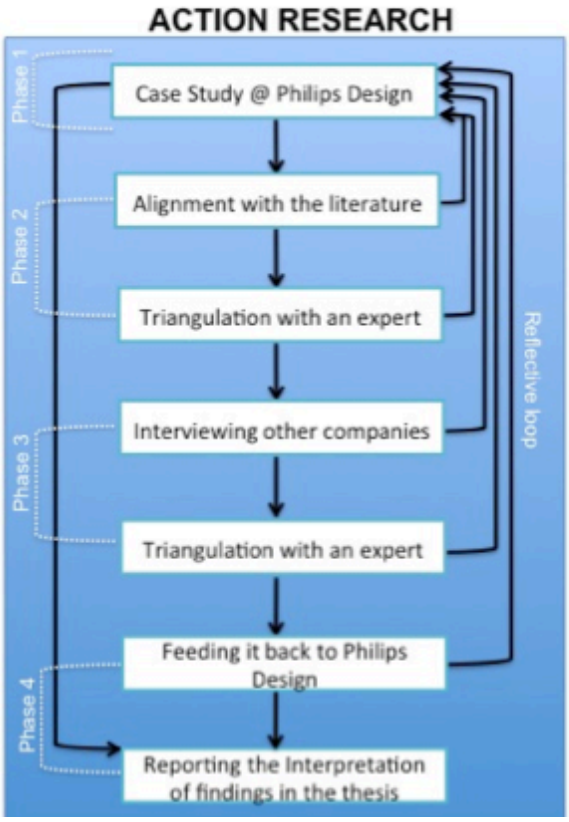

Figure 6: Diagram of the overall work flow in the research.

Figure 7: Mixed method research.

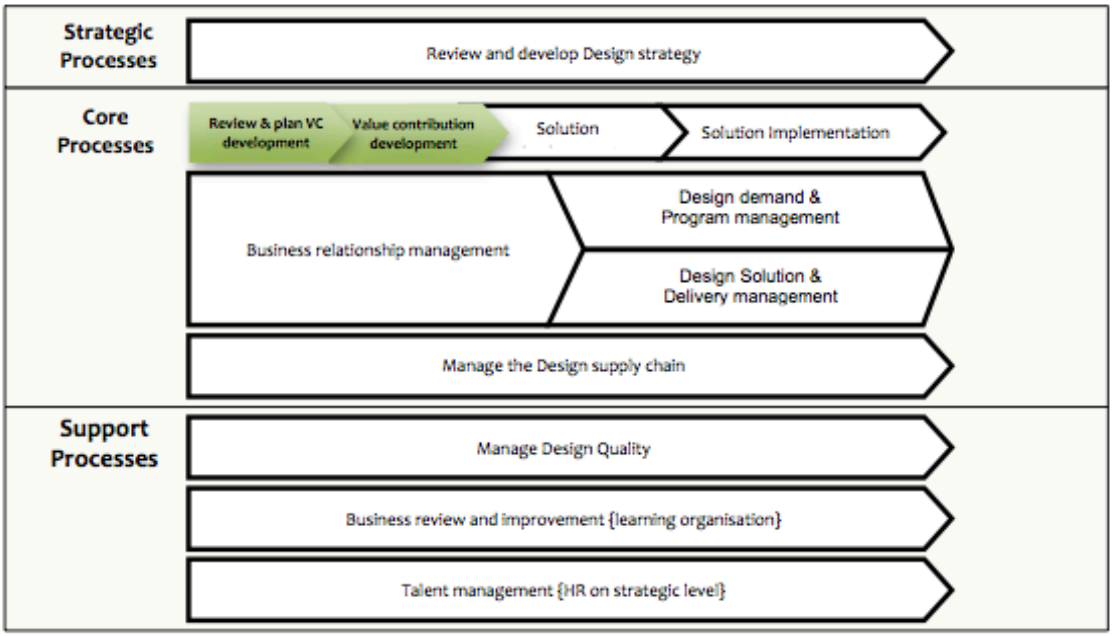

Figure 8: *Design leadership & intelligence used as a core process at the strategic level (Gardien, 2008).*

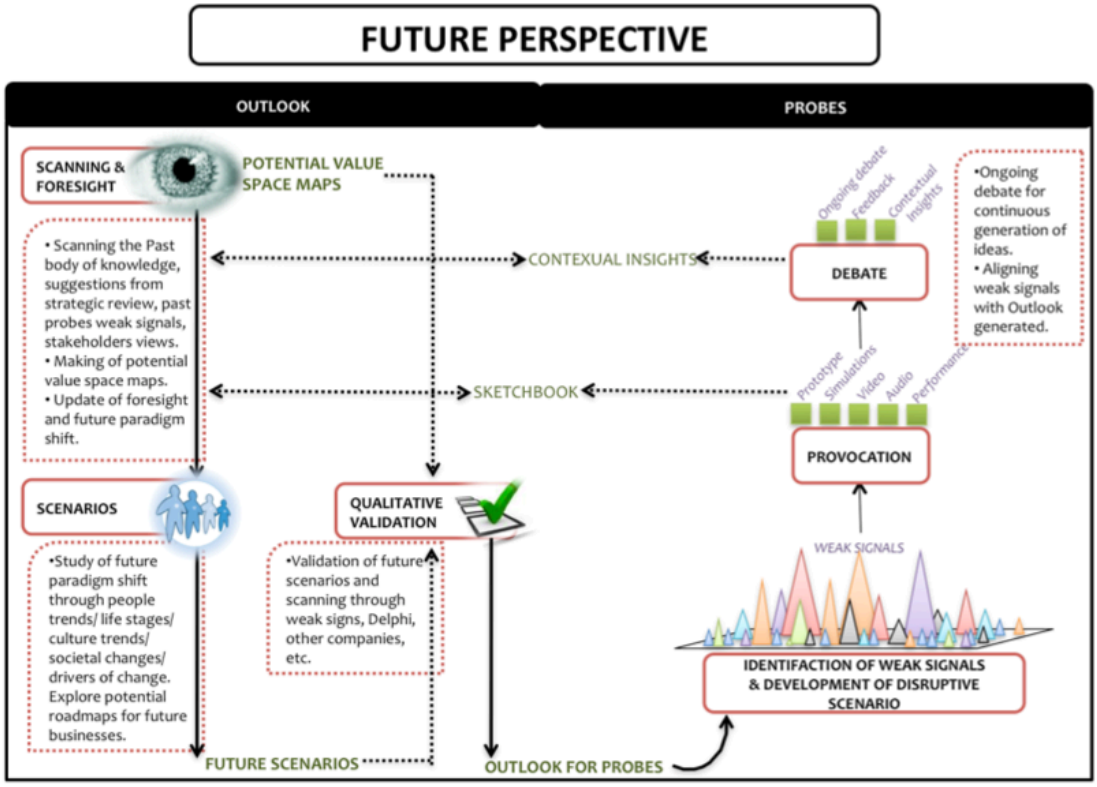

Figure 9: Future Perspective: The first phase of the innovation process map

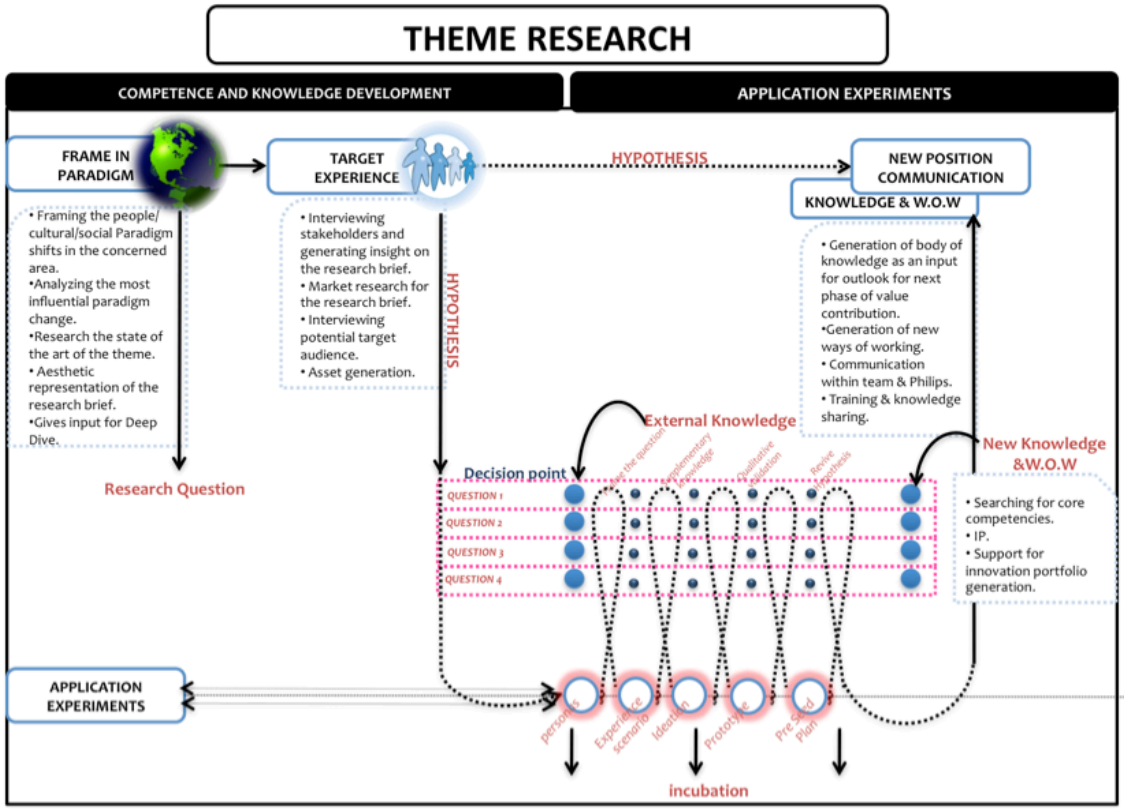

Figure 10: Theme Research: Second phase of the innovation process map.

Figure 11: Design value contribution: Third phase of the innovation process map.

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